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RECORD

NOVEMBER 1959

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RECORD

Reappraisal of Secondary Education*

MILTON J. GOLD

Associate Professor, Hunter College

IN THE sequences of the Edward G. Robinson gangland movies there used to be continuing concern with a gangland crime called "muscling in on the other guy's territory." Some of us who had been criticizing conventional high school programs for years must have reacted to suspected commission of this crime in the academic cloisters when unprecedented advances in science aroused copious and sharp criticism from outside the profession. At least unconsciously, many professors of education, as one group, must have resented the "muscling in" by professors of history and foreign languages.

If we look back at the scene dispassionately, we have to admit that no criticism could have been more devastating than the caustic reports (within education's own ranks) of the American Youth Commission, the New York State Regents Inquiry into the Cost and Character of Education, and the Eight-Year Study of the Progressive Education Association. Yet there was acceptance, at least on the theoretical level, of these criticisms, whereas there have been marked defensiveness and rejection of the evaluations and proposals made during the past few years.

School people being no more unreasonable than others, there must be sufficient reason for the differences in response to the two waves of attack. It may be useful to compare certain aspects of the appraisals made in the 1930's and 1940's with the criticisms in the current period.

* An address given at the Teachers College, Columbia, Work Conference on Secondary Curriculum, July 20, 1959.

THE CRITICS

To begin with, who has been identified with criticism in each case? In the earlier criticism the Albertys, Benjamins, Coreys, Mackenzies were people with long histories in common school education and the preparation of teachers. True, they were regarded by a number of high school teachers as well as by laymen as theorists, but none could deny firsthand contact with the scene. Current attacks seem to come mostly from those outside the profession and from college professors in the academic disciplines. In the vanguard are journalists, military figures, and history professors. They make no apology for their lack of familiarity with education at the elementary and secondary level. The academic college professors, regarding education as essentially a matter of presenting the subject content of their disciplines, seem to feel that their authority is above question, and that the persons who have merely spent a lifetime in teaching at the high school level and in research into the teaching–learning process should be properly respectful in their presence.

THE OBJECTS CRITICIZED

A delightful equivalence characterizes the objects being criticized then and now. In substance, high school programs in 1959 differ little, unfortunately, in most places from those in 1935. The professional critics of yesteryear were taking to task high school programs as they knew them to be from actual firsthand experience. Today's critics are attacking in reality the same program but they have little contact with the object of their concern and they believe that the fundamental reorganizations recommended by the earlier critics have taken place. They mistakenly recall a paradise in the 1930's which simply did not exist. They also postulate a chaos today, also nonexistent, and blame it on the professionals in education. The change actually is not in the schools but in the perspectives of the critics and in the proposals for reform.

FOCUS OF CRITICISM

The rise of Fascism in Europe, World War II, and efforts to secure the peace placed a spotlight on democracy in earlier appraisals which is missing today despite the great ideological conflict of the Cold War. The obvious dislocations of the depression led to concern about social institutions and needs for change. The depression also highlighted the failure of schools, in their preoccupation with college preparation alone, to provide meaningful employment preparation. The individual came into focus more as a total personality than as a disembodied brain. Speaking this year at the annual conference of the Association for Childhood Education, President Harold Taylor of Sarah Lawrence College succinctly stated the point of view:

> The fundamental principle of democratic education is that each child must be encouraged, protected, loved, cherished, respected, and taught so that he may become the most that he is capable of becoming.
>
> Schools and colleges must be agencies for transforming and re-creating the values of each generation. If each child is to be given a chance to develop fully, the school and society should not simply impose an old set of values upon the new generation. If truth and ethical principle are to be learned by the child, he must *rediscover* truth and principle for himself with the *guidance* of sympathetic parents and teachers. . . .
>
> The *progressive* idea in education is to consider the child in his own reality, to bring his powers to fruition, and to give him a chance to serve his society in the ways best suited to his talents. The *authoritarian* idea is to decide what are the needs of society for trained manpower and then

to set children to work in school to fill these needs.

Today's criticism claims that the pendulum has swung too far, although some observers think the pendulum's movement has been appallingly slow. The academic critics feel—and a number of high school teachers agree vociferously—that the schools have assumed far more responsibility than the public ever wanted them to take and accordingly have ceased to perform well their major role—training the intellect and imparting mental discipline. Admiral Rickover, for example, claims that we have substituted know-how subjects for solid learning; that we are surrendering to a tendency to fritter time away with instruction in the minutiae of daily life.

SOURCES OF CRITICISM

This criticism reflects the contrasting sources of the two eras of appraisal. Obviously, psychology and other behavioral sciences in the past half-century have given little support to the mental discipline theory which today's critics still espouse. The sources of this criticism are to be found in academic tradition, in a time-worn faith in the superiority of certain subjects as "training for the mind." This tradition is accompanied by the analogy often cited of the mind as a muscle which needs regular, systematic stretching. And it is sometimes said, sometimes implied, that the harder, the more distasteful, the more meaningless the task, the better for stretching the mind-muscle. Frankly, sitting in my armchair and philosophizing, I too find this doctrine attractive, but I am a hapless victim of modern psychology which tears away this comforting assurance that there must be some good in ill, after all; that a subject may be worth forcing on young people even though it has no appeal to them and no usefulness to them or to society. Max Lerner made short shrift of this defense of subjects through tradition alone in his address to the Association for Higher Education last year and subsequently in a column, "Four Fallacies in Education," in the New York *Post*.

Noting a "fallacy about 'academic' and 'non-academic' subjects," Lerner writes:

> Suddenly our thinkers have made a great discovery, namely that some high schools and colleges are teaching a number of damn-fool courses, such as cosmetics and coed cooking and the physics of home lighting. The result is a big outcry to scrap these and get back to mathematics and chemistry and history and the other subjects that are "academically valid."
>
> I will join anyone in attacking whatever is mediocre, slack and easy in our educational system. But some of the sleaziest and most mediocre teaching I have seen has been in the conventional "academic" courses, and some of the most exciting has been in the "new" courses which explore the frontiers of psychology, anthropology, philosophy and esthetics. Sure, let's get rid of the monstrosities meant to give students some easy academic credits. But I suspect anyone who tries to draw a line between subject matters, calling some acceptable and others tabu.

On the other hand, the critics of yesterday took as sources dynamic principles in learning theory and concern for the democratic tradition. These led to concern with the learner as an individual, to emphasis on active participation by the student in learning, and to a dual concept of integration—integration of subject matter in place of current fragmentary specialization, and new integrations of experience by the organism as a definition of the learning process. Perhaps this matter of integration as much as anything else aroused the academic critics. The college specialist in a subject area ceased to be the center of the world

of learning. The subject was no longer both the means and the end in learning. In its place was a concern with the individual's total personality as the goal of schooling, and the means was such subject matter as might be relevant. Content was viewed as something which had to stand on its own merits, not on its virtue as the first step in a university specialization.

LEARNING THEORY

Still another contrast has been touched upon incidentally, the matter of learning theory. Yesterday's critics looked upon learning as being dynamic, open-ended, purposeful, a matter of change in behavior. Today's critics have resuscitated the notion of learning as the storage of predetermined subject matter and tied to it the attractive but misleading labels of intellectual training and liberal education.

PROPOSALS

As should be expected, such contrasting approaches have led to conflicting proposals for action. Concern for a common life in a democracy was basic to yesterday's proposals for common learnings and general education programs, often with a high degree of integration of learning experiences. The proposals we hear today advocate the conventional curriculum of separate, unrelated subjects whose end lies in themselves. Learning by doing meant laboratory practices in citizenship, projects, and participation of various kinds. Learning as the absorption of information leads to a new emphasis on lengthy homework assignments.

In the past decade or two we have seen a gradual broadening of the concept of evaluation, outgrowing the sterile limitations of objective testing seemingly for its own sake. Evaluation has come in many places to be regarded as a process in learning, involving the learner as a participant. Our new guides are returning to testing for purposes of comparison and for standardization of the curriculum. Soon after the launching of the first Russian satellite, President Eisenhower called for a nation-wide testing program to seek out high school students with aptitude in science and mathematics. The urge to establish a national system for comparing one student with another has been reinforced by competition, real or imagined, for college admission. The snowball has gained such alarming proportions that the College Entrance Examination Board itself has found it necessary to advise parents against engaging coaching services for their children.

Many of us are alarmed at the apparently unanimous advocacy of allegedly homogeneous grouping. This is a concomitant of the resurgent academic tradition. Yet nothing in educational research supports homogeneous grouping as being better for bright, average, or slow students. Current research by the New York City Board of Education shows no differences among students of comparably high ability who have attended special schools in New York City, special Honors Schools within general neighborhood schools, special Honors Classes in high schools, or just regular, unadorned cross-section classes. The critics of the earlier period advocated mixed groups because of their interest in every citizen's understanding of other citizens. Today's critics are looking only at their unproved conviction that knowledge may be stored more expeditiously when classes are grouped according to ability.

Existing high school programs—at least in schools of adequate size—offer a great variety of courses. In many parts of the country, students select courses with guidance of the school staff and are pro-

grammed individually. Yet in many areas track programs are still common. The student enrolls in the college preparatory, commercial, general, vocational or other course at the beginning of his high school career, and his program is then fairly well mapped out for him. Even in elective areas, a pattern must be followed. The track system entails less flexibility for individual planning than the older critics thought desirable. In addition, it establishes a hierarchy of courses within the school and an attendant ability grouping. Newer critics seek either more tracking, as Conant does, or return to the still earlier pattern of a single curriculum, as does Rickover, where all students follow a fairly well prescribed program or else give up the educational ghost. The philosophical issue lies in the difference between suiting the program to the students or the students to a preconceived program.

GUIDANCE

Not only program, but guidance proposals reflect the differing premises of the two groups of critics. The earlier group sought adjustment to life and its demands; the later one is concerned only with preparation for college. Frank Bowles, President of the College Entrance Examination Board, had this to say to the Association for Higher Education earlier this year:

> The American secondary school as of today has been deprived of its mobility. By mobility I mean the freedom to set new goals, plan new programs, accept new responsibilities—in other words, the freedom to develop diverse forms within the broad framework of secondary education.
>
> I read and I hear my evidence in reports, articles, books, speeches, and public documents, all of which now define the purpose of secondary education within terms essentially traditional. These terms acknowledge only two forms of secondary education—one which prepares for higher education, and one which fails to do so and is too often, for this reason and this reason only, denounced.
>
> This definition of the secondary school's role is important for three reasons: first, because it gives to secondary schools as their major task a fixed task; second, because it does not accept any but traditional methods of carrying out that task; third, because it represents or appears to represent public opinion—and public opinion operating through the peculiar political heritage of local control of primary and secondary education has, at least for the time being, established this point of view. . . .
>
> . . . it is now about forty years since the idea of mass secondary education—then totally new—encountered the entrenched concept of secondary education as college preparation. In the end, both have won. Mass education is numerically stronger with its own curricular arrangements, but it has lost in a bid to control the curriculum. College preparation, numerically weaker, has been established as the primary task and is in the intellectual ascendancy.

But saddest of all is the blithe ignorance or neglect of research which would warrant the program advocated by the earlier critics as a sounder method of preparing for college as well as a better way of meeting life's demands. Once and for all the Eight-Year Study should have established this fact. Unfortunately, today's critics have no long-time background in secondary education and little familiarity with research that has been done. They may thus make their claims unfettered by the findings of the Eight-Year Study, a parallel study by the Southern Association of Secondary Schools and Colleges, and by numerous studies carried out on a smaller scale elsewhere which do not support the traditional college preparatory program as the best or the only way of getting ready for higher education.

Of basic significance in the guidance

issue is the approach of the critics. The older critics supported what Harold Taylor calls the progressive idea, focusing on the individual, his needs, and his potential participation in and contribution to the culture. Today's critics unwittingly begin with the authoritarian idea, seeking to force the child into the mould of current national or social needs. The first starts with a sense of responsibility to the individual, taking his gifts and handicaps into consideration. The second seeks the gifts and implies rejection of the average and the handicapped.

A sober look at secondary schools in the past quarter-century will reveal no startling changes in either direction. It is my feeling that the movement, however slow, in directions advocated by the first set of critics has been retarded by the new attacks, and in some places the move forward—as I see it—has been reversed. More noticeable has been the joyous reaffirmation by schools that never sought to change their traditional goals, points of view, and programs. I know one man who says, "Education is the darnedest thing: simply by standing still, come twenty years you're in the forefront of new movements."

A number of questions about contemporary secondary education trouble me. For one thing, I am concerned about intellectual endeavor in our high schools. I know that the old assign-study-recite-test routine did not stimulate much in the way of creative thinking or of real mental effort, but I am not convinced that we are doing as well as we ought to in this regard even where new programs are in effect. I'm concerned here with the quality of student thinking, not simply the amount of information dispensed or homework required.

Second, one of the things that distresses me when I visit secondary schools is the lack of purpose generally evident. Youngsters are rarely intrinsically interested in what the school offers. Remove the grading system, report cards, attendance requirements, diploma and college entrance requirements, and the students simply wouldn't be there. How did we ever arrive at the "fix" we are in, where youngsters go daily through a rigmarole that makes no sense to them except in its rewards and punishments? The proposals of the latter-day critics are likely to aggravate this situation, too.

Third, I am scared by the intellectual, social, and ethical values that characterize the dominant pattern in American life today. Anyone who denies the strength of the "What's in it for me?" motive is simply looking through rose-colored glasses. The stress of our "affluent society" upon personal comfort and acquisition as primary values gives me a feeling that our culture is drifting toward sterility and meaninglessness. Is this all that life has to offer? What part does the school play in a culture dominated at least momentarily by highly material values?

Fourth, I am convinced that we need a new pattern in the organization, financing, and control of school systems. I do not believe that the local school board is the best means we can develop for operating school systems that have national and international ramifications. I am equally convinced that national, centralized patterns that characterize European education are undesirable. I believe that schools should be close to the people and should enlist citizen participation in planning. But I have seen too many cases of groups with axes to grind being allowed to speak for the whole public, of demagogues replacing top educators. We have taken many years to arrive at a sense of professionalism—and have not yet suc-

ceeded—because (1) at times we have let provincial, uninformed, uneducated, narrow-sighted persons run school systems by virtue of election to school boards, and (2) we have encouraged the thought that the schools are everybody's business, and as a corollary that you don't need to know much about the school business to run them.

Who should make decisions for our high schools? What are functions of professionals and nonprofessionals in the planning process? Is there any better unit for control and finance than the local board as one alternative and federal operation as the other?

With this look at appraisals of secondary education in the past and present, we should be ready to consider what makes for a good school program today and in the near future. The past, as the Archives Building in Washington affirms, is prologue.

Interaction of Education and Industry in England

GEORGE BARON

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BEFORE World War II the vast majority of boys and girls entering industry in England did so after an elementary school education ending at age fourteen. Among these young people were many of high intelligence and solid determination who made their way to posts of managerial responsibility by their day-to-day service to their firms and by dint of hard study in their scanty spare time.[1] Indeed, industry did not normally look to secondary education for its recruits, save in respect to its administrative and higher clerical posts, and its interest in the universities was confined to drawing from them relatively small numbers of engineers, physicists, and chemists.

The situation now, of course, is very different. Not only more of the grammar schools but also larger numbers of the "new" secondary schools, whether secondary modern, secondary technical, or comprehensive, are keeping their ablest and most purposeful boys and girls until they are sixteen or older. Therefore, in order to ensure a supply of able recruits, industry can no longer confine its attention to those who leave school as soon as the compulsory school-leaving age of fifteen is reached. Advances in production and organizational techniques, and the realization that mastery of them alone can counterbalance Britain's loss of capital resources and bargaining power, have made knowledge and skill qualities something to be sought out and developed, rather than, as in the past, commodities to be bought on the open market.

In order to understand the response of both education and industry to the new situation it is necessary to take into account the attitudes, often not fully appreciated, that they have inherited from the past. In the first place, the strength of the tradition of "liberal education," stemming from the older universities and the Public Schools and permeating all higher education in the nineteenth century, resulted in scientific and certainly technological subjects being consigned to the periphery of educational thinking and policy. In those institutions that grew up to provide instruction in these subjects —the university colleges and technical colleges in manufacturing towns—little financial help was available to the full-

[1] *Management Succession*, a recent research study published by the Action Society Trust, shows that half of all those occupying managerial positions did not have a grammar school education and that four out of ten senior managers and seven out of ten junior managers started at the bottom, as manual or clerical workers, laboratory assistants, or salesmen.

time student and emphasis was almost entirely upon part-time study.

In the second place, the persistence of apprenticeship, with strong pressure from organized labor that boys should begin to "serve their time" as soon as possible after the compulsory school-leaving age had been reached, inhibited the development of technical day schools and made night school the accepted vehicle for further study.

REFORMULATION OF THE APPRENTICESHIP SYSTEM

The new approach to apprenticeship dates from 1942, when the Ministry of Labour set up consultations between both sides of industry, represented by the British Employers' Confederation and the Trades Union Congress. The purpose of these consultations was to discover how existing methods of recruitment and training of entrants for skilled occupations could be improved. Three years later a report was issued which urged that in each industry there should be set up a National Joint Apprenticeship and Training Council, charged with devising appropriate training schemes and with promoting their adoption by individual firms. These schemes, which have now been drawn up for some 110 occupations, follow in most respects the traditional pattern. That is, they are concerned with the training of craftsmen in the skilled trades and usually provide for a five-year period of apprenticeship ending at age twenty-one. What was new, however, was the insistence that practical training be linked with further education, it being laid down in practically all cases that, until age eighteen at least, the young employee should be released one day each week to attend classes related to his trade. Here the schemes were influenced by national policy in the educational field which, as expressed in the Education Act of 1944, laid down that compulsory part-time education should be provided in county colleges for all young people between the time when they left school and their reaching age eighteen. "County colleges," in the sense of distinctive institutions concerned very largely with general education, did not materialize, but it became accepted by local education authorities that they should make every effort to provide day-release classes for those whose firms gave them opportunities to attend. As a result, one of the most significant developments of the postwar years has been the increase in the numbers of young people attending classes in their firms' time and being paid by the latter to do so. Whereas in 1938 only some 50,000 benefited from "day-release," the number is now over 400,000.

The drafting of over one hundred apprenticeship schemes and the acceptance of the principle that working time should be set aside for further education are substantial achievements, seen against the background of the prewar years. A framework of relationships between education and industry has been created which, despite—or perhaps because of—its weaknesses, demonstrates the need for further advance.

These weaknesses are indeed considerable. It is clear, as has been strikingly brought home by the results of detailed investigation,[2] that practical training within industry is rarely in the hands of skilled and trained instructors, that courses followed in technical colleges are often too advanced and "theoretical" for the average young craftsman, and that much of what is done under the guise of apprenticeship is wasteful of the time

[2] Gertrude Williams, *Recruitment to Skilled Trades* (London: Routledge & Kegan Paul, 1957).

and effort of those concerned. Moreover, although "blueprints" for apprenticeship now exist, they are backed by no statutory authority that can insist on each industry and each firm doing its share. What is involved, therefore, in considering how the framework already devised can be filled out, is the fundamental question of the responsibility of industry as a whole for the production of the skill that it needs. This major issue will be considered later, but first it is necessary to consider other aspects of the coming together of training within industry and further education.

EXTENSION OF APPRENTICESHIP SYSTEM

Together with the efforts to give new form and meaning to the training of craftsmen there has been very substantial concern regarding the supply and training of workers for the technical and professional levels. Such workers cannot, of course, be any longer recruited in sufficient numbers from among the abler craftsmen, as was the general practice in the nineteenth century. Nor is the concept of full-time study, save for those of high academic ability, consonant with the essentially "practical" temper of English industry or with the selective character of English universities. The solution arrived at has been the simple one of evolving various grades of higher apprenticeships, for which specified levels of school achievement are required and in which technical studies play a very important part.

Thus there are apprenticeships (generally designated as "technician" or "staff" apprenticeships to distinguish them from craft apprenticeships proper) for boys of sixteen or seventeen who leave school with Ordinary Level passes in the General Certificate of Education in Mathematics and Science subjects.[3] Such boys aim at gaining Ordinary National and Higher National Certificates[4] which, though designed to meet the needs of the practising technician and technologist, are concerned with the fundamental disciplines of applied science rather than with the actual processes of production. On the other hand, the practical training undergone by those studying for these certificates may follow very closely in its early stages that given to craft apprentices, especially in firms too small to make effective graded schemes feasible.

At a higher level still there are the apprenticeships designed for boys of eighteen or nineteen who hold "Advanced Level" passes in the General Certificate of Education and who, since few secondary modern school or secondary technical school boys can reach this standard, come from the grammar schools or the independent Public Schools. These boys are the future research workers, technologists, and managers and their training may be phased in several ways. In some cases they spend alternate periods of six months in full-time study at a technical college and in practical training at the works; in others,

[3] This represents a relatively high level of achievement, since the General Certificate of Education is designed for the 20 per cent of the school population entering the selective grammar schools (although other boys and girls are not debarred from taking it, and are even encouraged to do so, if they can reach the standard required).

[4] The Ordinary National Certificate, which requires normally three years of part-time study and the Higher National Certificate, requiring at least two further years, form the main route leading to acknowledged status in many branches of engineering, building, and other technologies. Their "national" standing is attested by the conditions of their award being agreed upon by major professional institutions (for example, Institution of Civil Engineers, Institute of Physics) and by the Ministry of Education.

after a year at the works, they are given university or other full-time courses at their firms' expense and continue their training during vacations spent in the works and complete it during a final year following graduation.[5]

SOCIAL IMPLICATIONS OF NEW PATTERN

The classification of entrants into industry into three main groups (omitting, of course, the vast and heterogenous mass of unskilled workers)[6] is necessarily rough and does not reflect the increasingly fine distinctions being drawn between different forms of higher apprenticeships. It does suffice to indicate, however, that industry is accepting and building upon the selective role of the educational system. In this context the most important feature of the latter is that it now sends out boys and girls distinguishable as those who have had no proved success in examinations, those who have a General Certificate of Education with a significant number of passes at O level, and those who have achieved one or more A-level passes. For each level, industrial education and training schemes have been devised to take into account length of school life and performance. Some have seen a danger, indeed, that recruitment to responsible positions in industry will take on an increasingly rigid and hierarchical pattern and that it will become impossible for any fifteen-year-old secondary modern school-leaver to climb to managerial rank. The general tendency, however, is for firms to keep all routes open and for transfer from one type of apprenticeship to another and from one type of course to another to be encouraged. Nevertheless, a longer school life and a solidly based secondary education are more important than ever before in England. There can, indeed, be no doubt that the fifteen-year-old school-leaver is at a great disadvantage in competing against those who enter employment a year or two later with a background in English, mathematics, and science that he does not have. Moreover, there are those who remain at their grammar schools until age eighteen or nineteen and enter upon student apprenticeships and, at a higher level still, those who enter industry with a university degree or equivalent qualification.

Differentiation among school-leavers of another kind has resulted from the growth and expansion of "day-release."

[5] A very important development in the field of higher technological education in Great Britain has been the institution of the Diploma in Technology. This is a qualification awarded by a government-sponsored National Council for Technological Awards, and is awarded for success in a course of university honors degree standard taken in a technical college. Its significance is that it seeks, through courses of a "sandwich" nature, to integrate college and work experience and to gear theoretical studies very closely to industrial needs. The Diploma in Technology has, despite its being introduced as recently as 1957, already established its position, the numbers enrolled in courses leading to this award already having passed the 2,500 mark.

[6] Detailed statistics of the various categories discussed are not available, since what each firm or combine does is very much its own affair and no reports or returns are required by the Apprenticeship Councils for each industry referred to earlier. However, on entering employment for the first time boys and girls have to state their occupation for National Insurance purposes (for example, in order to be registered for unemployment pay, sickness benefits, and so forth). They are then classified under four heads by the Youth Employment officer or Ministry of Labour official responsible: (1) Apprenticeship, or learnership, to skilled crafts (including employment leading later to Apprenticeship); (2) Employment leading to recognized professional qualifications; (3) Clerical employment; and (4) Other employment.

The latest available evidence indicates that about one-third of all school-leavers (who total about half a million per year at present) fall within one of the first three categories.

Before the war, when it was relatively unusual for young wage earners to be released for purposes of study during working hours, a boy's progress toward a technical qualification depended not so much on the attitude of his employers as upon his own willingness to use his evenings for the purpose. Evening study is still general in England and is often coupled with day-release schemes, but those who can follow only this path are competing with many others who have the advantage of attendance at day classes. Moreover, most of the highest qualifications, and especially the Diploma in Technology, stipulate that time shall be spent in gaining practical industrial experience and, in fact, are effectively confined to those who are employed by or can secure attachment to firms prepared to cooperate with technical colleges operating "sandwich" courses. Furthermore, professional institutions are becoming increasingly critical of the adequacy of part-time study and the Institution of Electrical Engineers has pointed out that, in view of a stiffening of its requirements for membership, the "main route to professional engineering through student apprenticeship will be by way of sandwich courses."[7]

INDUSTRY AND EDUCATIONAL ADMINISTRATION

It can be argued that the shifting of emphasis from evening study to day-release, sandwich, and full-time courses is challenging the principles upon which the administration of education as a public service has been developed in England.

The functions of educational administration may be defined as the provision of educational facilities; the selection of those to benefit from them; and the creation of means, generally in the form of grants or scholarships, by which those selected may be enabled to use the facilities made available. Thus, while courses of study in universities and especially in technical colleges have very closely reflected industrial needs, they have been open to all who could, with or without the help of public funds, find the time to attend.

Now, however, while facilities for technical education are still, with few exceptions,[8] provided by the educational system within its own schools and colleges, the decision as to who shall benefit by them rests more and more with individual industrial concerns. Indeed, industry has developed a range of scholarships which compete very effectively with those provided by the state, the local education authorities, and the universities. A number of large concerns, such as the National Coal Board, provide scholarships for university studies that are, unlike those offered by the Ministry of Education and the local education authorities, quite unrelated to parental income.[9] Many others send carefully se-

[7] The Institution of Electrical Engineers, *The Education and Training of Student Apprentices in Electrical Engineering* (London, 1958), p. 22.

[8] The extent to which industry is a direct provider of education, general or technical, is small. There are training workshops and laboratories and training sections for advanced research workers within large concerns, but their purpose is to supplement, or, in some cases, to go beyond the work of the technical colleges rather than to replace the latter. There are also a score of large firms or industries that have their own centers for management training.

[9] All students admitted to full-time courses in universities and technical colleges are eligible for grants from the Ministry of Education or their local education authorities to cover the total cost of fees and maintenance. These grants, however, are graded according to parental income. Thus the son of poor parents may have all his expenses paid, while the son of well-to-do parents will receive little or no

lected young employees to sandwich courses in technical colleges and other institutions and pay their salaries during the whole period of attendance. In this way, industry is taking an increasingly significant part in the administration of higher education, sharing with the statutory educational system some of its most important functions and especially those associated with the distribution of opportunity.

An industrial concern has not, of course, any definite hold over those whom it sponsors in this way. No premiums are exacted and it is legally impossible for a firm which, for example, has paid for a young man to go through a university, to require that he should join the firm after completing his course, although it is understood that he will normally do so. Moreover, there is no obstacle to his moving elsewhere at any time during his subsequent service. From the point of view of the trainee, of course, he has clearly all to gain by making a good start with a firm which is closely interested in the use that can be made of his knowledge and skill.

IMPACT OF INDUSTRY ON THE SCHOOLS

In view of the demand for more and more highly trained scientific and technical personnel, it is interesting to note that there is virtually complete unanimity that secondary education should remain general rather than become vocational in character. Yet this is the case, the view being that the schools should give as broad an educational background as possible with particular reference to English, mathematics, and science upon which, if adequately mastered, the superstructure of technical knowledge can be built. It is, indeed, within the schools themselves that the need is most keenly felt for pre-technical courses as a means of giving "reality" to the curriculum.

Nevertheless, the influence of industry has made itself felt in a number of ways, one of which has been the building of a bridge between the industrial world and the Public Schools.

Traditionally, the English Public School is associated in the minds of most people, at home and abroad, with careers in government service, law, politics, the church, or family businesses. Since before the war, however, a group of far-sighted headmasters have realized that if their schools are to continue their main function of providing leaders in all important aspects of national life, attention must be paid to the scientific and technological aspects of industry. In fact, as early as 1936 the Public Schools Employment Bureau (now the Public Schools Appointments Board) was founded with this aim partly in mind. It now plays an important part in bringing boys in some two hundred leading schools into touch with the opportunities which are available to them.

The major problem which the schools have had to face is lack of capital with which to build and equip laboratories on the scale needed if they are to turn out the science specialists so urgently required. It is difficult to see how, in fact, many could have hoped to compete effectively with grant-aided schools if it had not been for the setting up of the Fund for the Advancement of Science through which some one hundred and fifty firms have made available four million pounds to promote science teaching in nearly three hundred Public Schools

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help. Hence scholarships offered by industrial concerns which impose no "means test" have obvious attraction for the latter, provided that he is prepared to make an early decision on his future career.

and independent schools. The great fee-charging schools have been assured of their place in the technological age, since there is no doubt that their prestige will make their products welcome in higher managerial posts.

Among grant-aided schools the influence of industry has been less direct, but has been felt through the efforts made to bring attractive training schemes to the notice of teachers and parents. In addition these schools are, by the nature of their links with central and local government, sensitive to the broad trend of national policy which, in recent years, has been dominated by the need for more scientists, technologists, and technicians. Despite the serious shortage of science teachers, the number of boys specializing in science in grammar school sixth forms has more than doubled in the past ten years. There is, however, in the grammar schools, little concern with the building up of purely technical studies, in the sense of extensive programs of work in machine-shop engineering, draughtsmanship, and what, in short, go in America under the heading of industrial arts. Indeed, practical work is often limited to elementary woodwork and metalwork in the junior forms. This is because boys who remain in the grammar schools until age eighteen or nineteen are preparing for the higher professional courses in universities and technical colleges in which a thorough grounding in mathematics, physics, and chemistry is all-important.

In the secondary modern and secondary technical schools, which are mainly concerned with boys leaving at age fifteen or sixteen to take up craft or technical apprenticeships, it might be expected that industry would press for inclusion in the curriculum of more and more vocational subjects. This is by no means the case. Here also the general feeling is that the schools should concentrate upon general education and, apart from acquainting boys with the use of hand and simple machine tools, leave trade training to industry itself. In such schools, technical subjects, whether related to engineering, building, commerce, catering, or other fields, occupy only about a quarter of the timetable. Moreover, the more able the boy or girl the greater the likelihood that he or she will be encouraged to build up a solid basis of academic subjects that will prove valuable at a technical college later. It is true that "workshop" and other practical subjects related to future employment have become an integral and important part of secondary education in England, not because of the demands of employers but because teachers and educationists have found in them a means of giving obvious purpose to school work.

INFLUENCE OF EDUCATION ON INDUSTRY

It would be a mistake to assume that industry is consciously seeking domination in the new relationships which it is establishing with education. On the contrary, industrial firms, in setting up their education and training departments, have accepted many of the assumptions and practices of the educational world. Thus the care which is devoted to new entrants is not restricted to training in the narrow sense of the term. What, in fact, is remarkable is the extent to which industry has taken over from the schools the idea of out-of-school activities as a means of developing personality and character. A well-known example is furnished by the Outward Bound Centres,[10]

[10] The Outward Bound Trust is the expression of the need felt to extend to youths in industry opportunities for outdoor adventure

situated in the more rugged regions of Wales and Scotland, where boys (and less frequently girls) go for mountain-walking, climbing, sailing, and other vigourous outdoor pursuits, all expenses being met by the firms that employ them. There are also the part-outdoor, part-indoor courses lasting for a week, of the National Association of Boys' Clubs. These are called Adjustment to Industry courses, and show a mixture of influences emanating from the out-of-class activities in schools, the youth club movement, and residential forms of adult education. Throughout the whole, runs the typically English idea that the best personal qualities, and especially leadership, can be fostered within a setting of leisure rather than of work. Other manifestations of the same approach are to be found in the Apprentices' Associations existing within individual firms, which sponsor debates, social evenings, rambles and team-games and which serve, as do their counterparts in the schools, to develop the social qualities of those who take part.

The education and training departments of large firms are, therefore, emerging as educational institutions in their own right. They are responsible for placing recruits in their appropriate grades, for watching over their progress and transferring them, as necessary, from one course to another, for arranging their admission to technical colleges and following every step in their careers, for promoting the leisure-time activities just described and for equipping, staffing and devising the programs of training workshops within their own firms.

of the kind enjoyed by boys in the more progressive Public Schools. It has been financed and supported by prominent industrialists who see in it a means to cultivate in their apprentices and trainees qualities of initiative, determination, and self-reliance.

The organization of such departments may be undertaken by men who have proved themselves in other administrative posts, but increasingly the education and training function is demanding the services of specialists who enter industry themselves as trainees and gain experience by moving from one firm to another. Such men are now developing a sense of common purpose which is increasingly finding expression through the courses and conferences organized by such national bodies as the British Association for Commercial and Industrial Education, the Institute of Personnel Management, and the British Institute of Management. There has already been some mention of the formation of a professional association or institute for this new group and of developing courses within the general framework of management studies to meet their special needs.

ULTIMATE RESPONSIBILITY

Much of what has been said applies, of course, to the larger and higher organized firms and combines, such as the National Coal Board, British Railways, the Iron and Steel Federation, English Electric, Bristol Aeroplanes, and perhaps two or three hundred lesser but still very considerable concerns. Only these have the resources and the hundreds or thousands of young people in training which make coherent and comprehensive schemes possible, although many firms with far smaller resources arrange for their craft apprentices to be released during working hours to attend their local technical college, and attempt to make their instruction "on the job" systematic and progressive. What is important is not the over-all magnitude of the trend described but the emergence of a core of assumptions and practices which are ac-

cepted as the foundations upon which education and training can be "institutionalized" in occupational fields in which this has not hitherto been the case. Thus the basic principles underlying the new forms of apprenticeship are at present being extended to commercial occupations.[11]

There are, however, a multitude of unsolved problems which are tending to hinder advance and which lie far deeper than the organizational level. Ultimately they arise from the very different natures of education and industry, the two structures which are involved. The former is concerned primarily with the all-round development of young people and with making knowledge available to individuals able and willing to profit from it. Industry, on the other hand, is concerned with the production of goods and services, and while the trained intelligence and skill of those who work within it are vital to its success, they represent means and not ends. A concern, for example, that operated excellent schemes for training, would go out of business if it could not sell its products owing to their high price or to other economic conditions. In short, the kinds of relationships at present existing in England between education and certain highly developed areas of industry depend upon conditions which are by no means stable even in times of relative prosperity.

This is clearly to be seen if attention is turned to the problems of the bulge in the number of school-leavers. Owing to the increase in the birth rate following the war the numbers of boys and girls reaching the statutory school-leaving age of fifteen will rise from the 613,000 of 1956 to 929,000 in 1962. It is therefore necessary to expand the provision for apprenticeships of all kinds very rapidly if the present proportion of skilled workers is to be maintained. But such a program of expansion of the training function, with the expense that day-release and other schemes involve, while in the long-term interests of industry and possibly practicable in very large concerns, is not economically possible over the whole industrial field.

To deal with this immediate and pressing problem, a number of solutions are being discussed. One already implemented on a small scale is "group apprenticeship" in which a number of firms join in providing facilities for training; another is the creation by local education authorities of "apprenticeship centres" somewhat on the lines of the French *centres d'apprentissage;* still another is the assumption of responsibility by each industry for the training of its young workers, levying on the resources of its members for this purpose. Finally there are suggestions that the government, either by subsidies or by tax remissions, should relieve industry of some of the financial burden of training.

So far, however, no decisive action has been taken. A recent government committee[12] went no further than advising that an over-all National Apprenticeship Council should be set up, "with the spe-

[11] Commercial education has grown up haphazardly around a multitude of examination systems developed by professional and voluntary organizations. Day-release is little developed and preparation for examinations is a matter for part-time study carried out in evening classes or through private correspondence "colleges." Clerical skills (for example, shorthand and typewriting) are introduced in the later stages of the secondary school curriculum in some girls' schools and are also learnt in post-school courses in both publicly maintained and private colleges.

[12] Composed of representatives of the British Employers' Confederation, the General Council of the Trades Union Congress, and the Boards of Nationalised Industries. Its report, *Training for Skill*, was published by Her Majesty's Stationery Office in January, 1958.

cific function of keeping apprenticeship in general under review," and it was made clear that this Council (now duly constituted), should confine itself to collecting and disseminating information. It has no executive power and its purpose is "to help, encourage and, if necessary, to exhort."

It seems likely that in the fairly near future there will be many types of expedients put forward to deal with the bulge of school-leavers and also to refine and extend "higher" apprenticeships. Each scheme as it emerges will, of course, have to contend with resistant elements within employers' associations, trade unions, and professional associations and with sectional interests within the educational system itself. A weighty body of opinion expressed by specialized educational journals (*The Times Educational Supplement* and *Technology*) under the same control as *The Times* and hence representative of established and conservative opinion, urges that government action is essential.[13]

Ultimately what is involved, in fact, are issues which are not basically educational or industrial in the narrower senses of these terms, but which are linked with the total structure of the technological society characteristic of the twentieth century. This being so, the problems which have to be faced in England (though not necessarily her attempts to solve them) are of general significance.

[13] Commenting on the problem of the bulge, *The Times Educational Supplement* stated recently: "There have been doubts about the wisdom of letting the Government interfere even more than they do with the detailed running of industry. The dangers of this are probably exaggerated: industry has been interfered with quite a lot since the days of *laissez faire*. What is important is that the lives of young people should not be wasted simply because there are a lot of them."

Elementary School Testing Programs Problems and Practices

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CONCERN about the effective use of standardized tests is widespread today. Administrators, teachers, guidance officers, and many other school workers are likely to have strong opinions on the subject of testing. Some may feel that teachers do not understand the technical aspects of testing well enough to prevent gross misuse of the results; teachers may think that the test makers are too far removed from the school situation; others may consider that many testing programs are a waste of time. Most would agree, however, on the qualities to be desired in a good testing program, and one does not have to search far to find a discussion of such qualities. It is more difficult to find reports of difficulties involved in carrying out a testing program or of procedures which are successful, reports which probably become buried in local school records or are handed down by word of mouth.

As a broader concept of the purposes of elementary school testing has developed, the testing program has become more closely integrated with the total school program. It still has its administrative values, but at the elementary school level in particular it should have even greater value in improving instruction. Teachers should be able to use the results of standardized tests to gain more knowledge of their pupils and thus be in a position to plan appropriate methods and curricula. The results of tests, standardized as well as teacher-made, should be useful in helping teachers to evaluate their own teaching. When tests are so used, it is important that they be properly chosen to reflect the aims of instruction, and it is especially important that teachers be concerned with and feel a part of the testing program.

In schools, now becoming rarer, where testing programs are conceived as being mainly of concern to administrators who want information to help them in sorting pupils into appropriate niches or in making decisions about the effectiveness of the curriculum, it may be desirable for the testing program to be planned and conducted entirely by administrative officials, with the teachers participating, if at all, only in giving and scoring the tests. Of course the tests need to be wisely chosen and the program, if it is to be effective, should be systematic

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and comprehensive. However, even in the use of tests for purely administrative purposes, the classroom teacher is a key person. When the teachers are not aware of the objectives of the testing program and do not have a knowledge of suitable techniques for administering, scoring, and interpreting tests, they may invalidate the results by coaching their pupils before a test is given, by giving them extra time during the test, or by creating an atmosphere of fear and tension.

It seems likely that the kind of testing program in a school will have considerable influence on teachers' attitudes toward testing, as well as on the effectiveness of their use of test results. Teachers will have a more positive attitude toward standardized tests if they have an opportunity to make suggestions about the choice of tests or if they are represented on the committee in charge of the testing program. It is also reasonable to expect that more effective use of test results will be made in schools where teachers receive competent assistance in interpreting results. One specific aspect of the testing program which is particularly likely to color teachers' attitudes toward tests is the use made of results in connection with the evaluation of teachers. In a school where teachers have been rated on the basis of their pupils' achievement test results one would expect to find attitudes of fear and distrust of tests and little use of the results of standardized tests at the classroom level.

Some evidence to support these assumptions is to be found in the cases described below, which are reports of actual practices in school testing programs. These reports are based on visits to schools, interviews with teachers, and responses by some 275 classroom teachers to a questionnaire about their use of standardized tests. The testing programs of the schools visited seemed to fall into several categories, and a representative example of each type will be given. Although the testing programs described are not necessarily typical of those in other communities of the same size, the problems which arose are likely to occur elsewhere and some of the practices followed may suggest what should or should not be done in other situations.

A COOPERATIVE PROGRAM

One school system represented in the survey was in an industrial city with nineteen elementary schools. For the past twenty-five years there has been a city-wide testing committee which includes a representative from each of the elementary and high schools. The members of the committee are chosen on the basis of their interest and training in measurement. They administer the tests in their own schools, being freed from their teaching duties for this purpose. These "building testers" work with the principal and with the classroom teachers in their own school and are also responsible for reports to the central office. Meetings of the entire group are held occasionally for the purpose of coordination, but the elementary group meets once a month. At these meetings, plans are made for administering the tests, ways of helping teachers to understand test results are discussed, and possible changes for the following year are considered.

The testing program, which is operated on a very limited budget, is planned to provide tests of intelligence, reading, and mathematics through the grades. New tests are introduced at intervals, but never without a tryout the previous year. During recent years all pupils in grades 4, 6, and 9 have been given reading and arithmetic tests, and those in grades 3, 6, 8, and 10 take intelligence

tests. An attempt is made to investigate further all cases of pupils with exceptionally high or low IQ's and those for whom there is considerable discrepancy among the IQ's obtained. Except for a problem inventory used with all pupils in grade 7, the rest of the testing is done in smaller groups, with emphasis on tests for the purpose of guidance in the junior and senior high schools. At least one new test is tried out experimentally each year, an oral reading test being one recently chosen for trial use. Some schools give tests in addition to those in the city-wide testing program, the cost being met out of the individual school's budget.

The intelligence tests used in grades 6 and 10 are machine-scored at a nearby teachers college. For these, as well as for tests scored by the teachers, summaries prepared by the central office are distributed. In the case of the achievement tests used in the elementary school, local percentile norms have been developed and are used by the teachers.

Through the years, intelligence tests have been tried at a variety of grade levels, but the present arrangement has been found to be the most satisfactory in this particular system. In grade 3 the intelligence test is not given until about the middle of the school year, since it is felt that many pupils would be at a disadvantage earlier because of difficulties in reading. In schools where an unusually large number of slow readers is expected, a non-verbal test is given at the beginning of the third grade.

A CENTRALIZED PROGRAM IN A LARGE CITY

In this case the city-wide program, planned by test specialists and administrative officers in the central office, consisted at the time of the writer's visit of a survey of intelligence and reading in grades 3, 6, and 8, and of arithmetic in grades 6 and 8 throughout the system. There were also tests of intelligence and reading readiness in grade 1 and of reading growth in grade 2 or 3, as well as an inventory of mathematical concepts in the same grades.

In this system there is little direct contact between the central office and the individual schools in the administration of tests or the interpretation of results. Before the tests are given, however, detailed directions for administering them and preparing the reports are sent out. Intelligence tests are administered by teachers who have been trained as official examiners, each of whom is usually assisted by the class teacher. When the results have been compiled, reports showing mean scores for the school, the district, and the city as a whole are issued. In general the teachers score the tests given in their classes, but a few of the tests are scored by machine in the central office.

The districts and individual schools are free to supplement the city-wide testing program, although limitations are imposed by lack of time, money, or interest. In one district there is a testing committee under the chairmanship of the principal of an elementary school. This committee, composed chiefly of principals, arranges for tests to be given in the district. In a recent year, for example, arrangements were made to give tests of language and study skills in grades 5 and 7 and a reading test in grade 4. Except for the study skills test, these additional tests could be omitted if the principal of a school so desired.

Even within a district there may be considerable variation in the testing activities of the schools. In one school, as a result of the interest in testing shown by their principal, the teachers have a

number of conferences each year in addition to those needed for giving instructions about routine matters in connection with the testing program. These meetings may be held at the suggestion of the school curriculum committee, or the principal may arrange a meeting when some problem arises, such as a change in the placement policy within the school system. Other projects which the principal has initiated include the investigation of intelligence test results which are not in agreement with teachers' estimates or with previous results, and an analysis of responses to the city's mathematics test. The teacher makes a new guidance folder for her class each year; this contains a record of test scores for each pupil and comments from the previous teacher of each child. These folders are kept on file in the principal's office.

In another school in the same district, the teachers have few activities directly connected with the testing program, beyond those necessary for administration of the tests and completion of the required records. At regular staff meetings, however, it is customary for the teachers to discuss problems connected with the testing program as the need arises.

A third school in the same system is in an area where the average socioeconomic status is rather low and where many pupils have language problems which, according to the teachers, tend to make test results meaningless. Not much testing is done except what is arranged from outside, and this probably would not be done if participation in the program were entirely voluntary.

Although external arrangements for the testing program in these three schools are essentially the same, implementation of the program is largely the responsibility of the principal. It appears that the amount of additional testing, the kind of in-service training, the degree of participation of the teachers, and probably their attitudes toward the testing program reflect to a large extent the interests of the principal and the special problems of the school.

A CENTRALIZED PROGRAM IN A SMALL CITY

In this city school system with some 600 teachers, the director of the testing program is a psychologist who is responsible for the opportunity program, classes for the mentally retarded, the high school guidance program, and individual and group testing, as well as for pupils who are physically handicapped and those who present attendance problems. The staff of the department includes, besides the guidance workers in the high schools, three psychological examiners whose major responsibility is to give individual intelligence tests, although they also give all group intelligence tests and check-score achievement tests. One of the three examiners is responsible for the high school opportunity class several days each week and thus is available for other duties less than half of the time. A secretary and a part-time clerical worker complete the staff.

The present testing program has been in effect only three or four years, but it has evolved with the development of the guidance department over a period of about ten years. At an earlier stage the testing done was planned by individual principals or by elementary supervisors, often with the purpose of evaluating teachers' work. Now meetings of all the teachers who are involved in the administration of tests at a given grade level are held, in order to make plans for giving the tests and to discuss administrative problems, but it has been difficult to arrange such meetings. More progress was

made when a meeting on scoring problems was held; plans were worked out for easing the scoring load by giving time off so that all teachers could cooperate in scoring tests, analyzing responses, and making reports. The actual choice of tests is now made by the guidance director, although he follows the practice of reviewing several possible tests and submitting his reviews and recommendations to the superintendent and supervisors.

The achievement testing program in this school system includes a battery of tests at the beginning of grades 2, 7, and 9. In choosing the achievement test battery it was considered particularly important to have a different battery of tests for each grade level and also to have in the higher grades tests which are machine-scoreable. Tests are also given in grades 3 to 6 at varying intervals, but in such a way that a child is tested at least once every two years during the elementary grades. It was stated that one of the main objects of the achievement testing program is to provide information on which to base remedial teaching. Teachers are encouraged to make detailed analyses of responses, but the general reaction has not been very favorable.

The achievement tests for grade 5 and higher are scored by machine at a nearby university. Other tests are scored by the teacher and check-scored in the department. If there are major errors, the tests are returned to the teacher for rescoring, a practice which has increased the accuracy of scoring. A recent attempt to analyze the errors of each teacher and to rate the scoring met with considerable resistance and was abandoned.

Intelligence tests are given at the end of kindergarten, in the middle of grade 4, and at the beginning of grade 8. Students entering high schools from outside the city are given both intelligence and reading tests at the beginning of their freshman year. All of the intelligence tests are administered and scored by the psychological examiners in the guidance department.

The director of the testing program prepares reports to aid teachers in the interpretation of results. Graphs are made showing class medians in comparison with city-wide results, and intelligence test profiles for each pupil are sent to the teachers of the grades tested. For pupils in grade 8 these records are forwarded to the high school guidance counselor. The elementary supervisors occasionally discuss results with individual teachers, but such discussions do not appear to occur very often, and the director feels that they may not always be helpful.

PLANNING AND ADMINISTERING TESTS

In each of the situations described above, the test program is systematic and reasonably comprehensive, being carried on from year to year with occasional modifications. There are attempts in each instance to provide reports which will help teachers understand the results, to make the test scores available to those who can use them, and to investigate individual cases which need special attention.

It appears, however, that some school officials are unwilling to trust the teacher even in relatively routine matters concerned with the administration and scoring of tests. Others are anxious not to burden the teacher with an undue amount of clerical work. There may be some advantages in having the scoring done by the teachers who have direct contact with the pupils being tested, but it is probably most important that the

scoring be done in a way which minimizes the likelihood that the teachers will develop an unfavorable attitude toward it. The use of machine-scoring facilities, of clerical assistance, and of cooperative scoring may help in creating a favorable attitude toward the program, but much more fundamental is the need to develop the feeling that the program is really worth while and that the results have value.

In the three testing programs described, the need for some training in administration of group intelligence tests was felt. Several teachers, when interviewed, mentioned the need for better administration of tests and reported cases where the directions were not followed carefully, timing was inaccurate, and pupils in the lower grades were tested in groups which were too large to ensure proper attention. Since in the ordinary school situation there seems to be no good reason for using a group test which is too difficult for an interested teacher to administer, it would appear to be best for the trained teachers to be among the regular staff, rather than specialists from a central office. It is much easier for the regular class teacher to participate in the testing and to learn from it something about her class.

The brief descriptions of the testing programs given earlier in this article show great variation in the amount of participation by teachers in planning the program. In some cities the size of the system may make adequate teacher representation on the planning committee unfeasible, and sometimes it is the opinion of those in authority that only supervisors and principals are competent to take part in this planning. Usually, however, there are possibilities at the district level or in the individual school for participation by the ordinary classroom teacher in the planning of the program. It is almost always feasible to have in each school a person like the "building tester" of the first school system described above, whose function it is to help teachers in both the administration and the interpretation of tests. A teacher with special interest and ability in measurement is likely to be more helpful at the elementary school level than a specialist, supervisor, or principal. In some systems an elementary school guidance counselor performs this function very well, working directly with classroom teachers in two or three schools at most.

Especially in cases where the teachers have not participated in planning the program it is likely that there will be a feeling that the testing done is mainly of concern to the administration, and possibly that not much use of the results is made at that level. This feeling was very evident in interviews with individual teachers. One teacher with twenty years of experience said that in her school the principal arranged the testing program, with tests of intelligence and achievement being given through the grades every three or four years. The reports were sent to the principal's office and the test booklets were passed on to the new teacher when the pupils were promoted, but no one ever seemed to make use of the results.

In all too many cases the impressions of the teachers are nearly correct; no one who receives the reports does, in fact, make any use of them. But even if the impressions were not correct, it is important that the teachers feel that their efforts are not wasted. A published summary is at least evidence that someone did pay some attention. Moreover, a well-prepared report may help considerably in the interpretation and use of the test results.

Still another problem in planning a testing program is that of suitability of the tests. The lag in adapting the content of standardized tests to a changing curriculum was mentioned frequently by the teachers interviewed. This lag is particularly serious in the case of arithmetic tests, for there have been extensive changes in many elementary arithmetic curricula in recent years. One teacher mentioned the use of achievement tests as a criterion for entrance into special classes for gifted children, and added that with the present curriculum in arithmetic it was excessively difficult for a sixth-grade pupil to obtain the required grade score on the achievement test. Another teacher pointed out that the testing program in her school still used the same arithmetic tests, in spite of the fact that the methods of teaching and the content had changed so much that neither the test itself nor the published norms were any longer appropriate. Moreover, the guidance department did not appear to be aware of these changes, since the forms which the teachers were given indicated deficiencies in arithmetic in cases where it was practically impossible for a child to obtain a score higher than the published average for his grade. Although the inappropriateness is more obvious in arithmetic than in other subjects, content of the tests used is a matter which needs more attention and closer cooperation between the test department and those in charge of curriculum.

Intelligence tests, too, need to be wisely chosen. Several of the teachers interviewed were concerned about the inappropriate use of verbal tests for children whose native tongue was not English. Others were well aware of the problem of cultural bias.

Another problem, and one less commonly understood, occurs when the teacher compares the results obtained by an individual pupil on a number of tests. In one school system three different intelligence tests were used in the elementary school, but no attempt was made to compare the results obtained, except in individual cases. In another system different forms of the same test series provided comparable medians from year to year at a given grade level, but the tests were used for many years before it was observed that the mean IQ for grade 6 pupils was some 4 points higher than that for the same pupils at the grade 3 level. Moreover, the standard deviation of the IQ's at the grade 6 level was about 13 points, compared to 10 for grade 3. This meant that an IQ of 121 obtained in grade 3 was equivalent to an IQ of 131 obtained in grade 6, and that a variation of as much as 20 points in the IQ's of children whose scores were in the upper range was far from unusual. The teachers in this system came to distrust the intelligence test results because they observed these discrepancies without understanding what had occurred.

INTERPRETING AND USING TEST RESULTS

Through committees on which teachers are represented, by suitable coordination of the departments dealing with curriculum and testing, and through training of teachers who can help in the administration of the testing program, it is not too difficult to see that tests are well chosen and carefully administered. Perhaps it is not too difficult to produce evidence to show teachers that the results are not ignored by the administration. It is less easy to convince teachers and even principals that, although the results are not ignored, neither are they used to evaluate the efficiency of teachers or of schools.

A large part of the resistance offered by teachers in the third testing program described above can probably be traced to fear that the main purpose of the testing program was to evaluate the individual teacher.

But in the elementary school the greatest value of tests should be in the use of the results at the classroom rather than the administrative level. Here we come to a much more difficult problem. Each of the testing programs described in this article made some attempt to help teachers interpret and use test results. Conferences were held to discuss the test results and any special problems which might have arisen. Teachers received reports summarizing and analyzing test results and sometimes giving suggestions for making use of the information obtained. In some systems, teachers had the opportunity to work directly with individuals who had some training in measurement.

Several items in the questionnaire answered by teachers in the schools included in the survey provide some indication of the proportion of teachers reached by these different kinds of assistance. About half of the teachers said that they had discussed the results of standardized tests in a staff or other group meeting. The proportion varied widely from school to school, however, being as high as 70 per cent in one system, while in another only 23 per cent of the teachers reporting said that they had attended such a meeting. Between 25 and 35 per cent of the total group said that they had either discussed results with a specialist in testing or had received some other kind of assistance in interpreting standardized test results.

It would appear that the large staff meeting may be useful for imparting directions about the administration and scoring of tests and perhaps for increasing understanding of the purposes of the program, as well as of the technical aspects of the norms and scales used. The published materials, if well done, can also help a great deal in these areas. For most purposes, however, a small group meeting or individual contact is likely to be most effective in helping the teacher to make use of test results in her own classroom.

A large majority of the teachers who replied to the questionnaire mentioned earlier felt that there was need for more effective guidance in the use of test results, in spite of the attempts already being made in their schools. Among those interviewed there were several who showed the need for such guidance. One junior high school teacher, for example, was willing to believe test results only when they confirmed her own judgment. She also appeared to expect that intelligence test results should show perfect correlation with achievement, for she was surprised to find that the brightest child in the school was not at the top of his class in achievement. A teacher who taught a fifth grade was unwilling to believe that the intelligence test could give a more accurate picture of a child's ability than could the teacher's judgment.

The perennial problems of the meaning of grade norms and the variability of IQ's were mentioned by a fourth-grade teacher. She said that she did not know which to take as the true IQ when several tests had been given, and that she did not understand how a child who didn't know any words at all could obtain a grade score of 1.9 on a reading test. Another teacher did not know the meaning of the percentile scores used in recording the results of an achievement test taken by her sixth-grade pupils.

On the other hand, several of the teachers interviewed showed commendable insight into the problems involved in the use of standardized tests. Some were especially aware of the relationship between the background of their pupils and the children's intelligence test results, a problem of particular significance in the area served by their school. Some showed concern about the need for identifying factors other than academic ability which help a child to succeed in school and in life. Still others, as already mentioned, were anxious that the content of the achievement tests used in their school be more closely related to the curriculum.

An attempt was made to compare the responses to the questionnaire by teachers from systems with different types of testing programs. The group which differed most from the others consisted of teachers in a number of small city systems where the guidance department undertook a considerable testing program with a small staff and little or no teacher participation in planning. These teachers were less likely than those in the other systems to report making use of test results. For example, only 27 per cent of them, nearly all of whom were from elementary schools, said that they had used standardized reading tests as a partial basis for grouping within a class, while from 55 to 70 per cent of teachers in the other systems had used reading test results in this way.

SUMMARY

The testing programs of three different school systems described in this article show a wide variation, not in the tests given or in the methods used to administer and score them, but in the way the program is handled and its general effectiveness. The teachers in one system have opportunities to make suggestions about tests and are represented on the planning committee. In another, the decisions about the tests to be used are made entirely at the administrative level; the teachers participate chiefly as scorers whose work is checked rather carefully. The principal's role may involve active participation, not only on a test committee but also in helping the teachers in his own school to interpret the test results and to use them properly. In other cases he may show resistance to the program because he is suspicious of the use the administration makes of the test results or because he feels that the tests are inappropriate and of little value. The staff concerned with the test program may include a number of specialists in addition to a test committee with teachers and principals represented, as well as specially trained classroom teachers. On the other hand, the staff may consist of a few overworked individuals who are responsible not only for planning the program and seeing that it is carried out, but also for many related areas such as remedial classes, guidance, and attendance problems.

The evidence presented here, through descriptions of actual testing programs, reports of interviews with teachers, and the responses of teachers to a questionnaire, all points to the need for greater attention to the teacher's part in the testing program. Awareness of the purposes of the program, a feeling of more active participation, and, above all, an opportunity to get assistance in interpreting and using the test results are what the classroom teacher needs. An understanding of technical matters, of grade scores, errors of measurement, and the like, is important, but far more important is the need to see how these grade scores can

be used to help in grouping or to identify the child whose achievement is far below his ability, to realize that a variation in IQ can sometimes be a signal that something is wrong and at other times a matter of little import. Moreover, it is time for the test specialist in the schools to become more keenly aware of the relation of achievement tests to the curriculum, so that he can really help the teacher to use the test results at the classroom level.

What Education Has to Learn from Psychology*

VIII. Individual Differences

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THE FACTS of individual differences are too well known to justify an extended account of them. Every teacher soon learns that the pupils in a class differ one from another in every conceivable way. So the main purpose of this article is to emphasize the extent of individual differences and to discuss the school's and the teacher's responsibility with respect to them.

Since reference has been made in earlier articles in this series to the fact that the Greeks were cognizant of the basic psychological concepts with which we deal today, it is only appropriate to say that both Plato and Aristotle recognized the facts of individual differences and insisted that education must adjust to them. In Plato's *The Republic*, Book II, in discussing division of labor in a state, Socrates affirms, "I am myself reminded that we are not all alike; there are diversities of nature among us which are adapted to different occupations."[1] And Aristotle in discussing qualities of character and emotions says, "It must be grasped that in every continuum that is divisible there is excess and deficiency and a mean, and these in relation to one another or in relation to us [that is, differences within an individual and differences between individuals], for instance, in gymnastics or medicine or architecture or navigation, and in any practical pursuit of whatever sort, both scientific and unscientific, both technical and untechnical."[2]

In modern times it is customary to refer to Galton as the first to point up individual differences. "The range of mental power between—I will not say the ugliest Caucasian and the lowest savage —but between the greatest and least of English intellectuals is enormous. There is continuity of natural ability reaching from one knows not what heights, and descending to one can hardly say what depths."[3] Galton was interested in pursuing the possibility that these differences were inherited.

* Article VII in this series was published in the October 1959 issue of *Teachers College Record*. The first six articles are available in a single pamphlet published by the Bureau of Publications, Teachers College, Columbia. $1.25.

[1] Plato, *The Republic*, II:370.

[2] Aristotle, *Eudemian Ethics* II, III. 1 1220b.

[3] Francis Galton, *Hereditary Genius. An Inquiry into Its Laws and Consequences* (London: The Macmillan Co., 1869), p. 22.

In the United States a pioneer in the study of individual differences was Cattell, who first used the term "mental tests" and "mental measurements."[4] Cattell studied with Wundt in his Leipzig laboratory, but he states that Wundt was not favorable to his first experiments in individual psychology, and that he received his greatest encouragement from Galton.[5]

Cattell studied what would today be considered very narrow mental functions such as reaction time, attention span, controlled association, rote memory, and a variety of sensory discriminations.

Over the years no aspect of human nature has been left untouched in the inquiry into variations in mental and physical traits. I can distinctly remember as a student hearing someone speak of the possibility of measuring personality and having the feeling that psychology was invading a private domain that it would be sacrilegious to enter. I can also remember the resistance from principals and teachers that had to be overcome when I first used a personality (adjustment) questionnaire with school children. Now no protest is raised against invading the innermost sanctuary of one's private thoughts and feelings.

With reference to education, individual differences become a matter of social psychology. As long as one is considering the learning of a single child it is not necessary to consider individual differences, but as soon as two or more children are taught in a single group the problem of the differences between them assumes considerable importance.

A fifth-grade teacher was finishing a unit on equivalent fractions. Members of the class took home an exercise in which they had to change fractions to equivalent fractions with larger or smaller denominators, for example, change 3/4 to ?/12. Of the thirty pupils, twenty-six had the principle of the exercise correct, but some made a few errors in division and multiplication. Four pupils did not understand the process of multiplying both numerator and denominator by the same number. One pupil was confused about the meaning of the words numerator and denominator, another had never clearly understood what was meant by multiply and divide, the other two had not paid attention and simply did not know the process. In a few days the teacher took up with the class the addition of unlike fractions. The twenty-six who had mastered the preceding exercise were ready to understand and learn this new process, but the other four could not comprehend what was going on because they had not mastered the process of changing into equivalent fractions. Here is an example of the way individual differences start. These small differences become extended as the class proceeds to subtraction, multiplication, and division of fractions, and hamper the children's understanding of decimals and percentage. But this elaboration of individual differences because one exercise is not comprehended is magnified many times as pupils master or fail to master each new concept, principle, or operation. Failure to master or grasp learning at any stage owing to absence, inattention, or not learning concepts or principles applies equally to learning to read or the learning of other complex skills. This difference may not be so apparent in the learning of content such as history or geography, or in social re-

[4] J. McK. Cattell, "Mental Tests and Measurement," *Mind*, 15:375-81, 1890.

[5] J. McK. Cattell and Livingston Farrand, "Physical and Mental Measurement of the Students of Columbia University," *Psychological Review*, 3:618-48, 1896.

lations, but failure to grasp fully a new concept or principle takes its inevitable toll in subsequent learning.

The problem faced by the teacher in the situation just described is how to present the topic of addition of unlike fractions to her class. If she stops to do remedial work with the four, she is wasting the time of the twenty-six. Obviously and ideally she should divide the class and give the four pupils different help from that provided the twenty-six. But this would mean devoting less time to each group and eventually, as pupils string out in their progress, the instruction would have to be completely individualized, which is obviously not only undesirable but impossible. Eventually some of the pupils would become so far retarded or acclerated that their progress in learning would be more like that of pupils in other classes in lower or higher grades or sections.

This simple illustration poses the fundamental question that education faces with regard to individual differences. Stripped to its essentials in this way, instruction in groups can proceed most effectively only when *each group consists of individuals at the same stage of learning in the material being covered.*

Grouping for effective learning is clearly recognized as essential in many activities. The novice in skiing requires instruction in a set of principles already mastered by the expert and a more gradual slope on which to practice than the expert would use. The beginner in swimming, who must confine his efforts to the shallow end of the pool, interferes with those who wish to swim the length of the pool. It has been found that members of psychotherapy groups should have some homogeneity in clinical categories and psychiatric diagnosis.[6] It has proved beneficial to segregate emotionally disturbed children in special schools or in subgroups within the school according to specific disabilities.[7] However, those who have given thought to the education of handicapped children do not favor segregation, not because of any advantage in instruction in having the handicapped child sitting with normal children, but to avoid making him feel inferior because he is different.

The educational problem of dealing with individual differences can be broken into two parts. The first part, how pupils should be grouped, includes deciding when a child should first enter school, what the school's promotion plan should be, and decisions about so-called ability grouping or sectioning, and the basis on which pupils should be passed from one level of schooling to another —junior high school, senior high school, college. The second part of the problem is concerned with how teaching within a group can best meet the individual differences within that group.

The facts concerning individual differences can be introduced by presenting the following simple distribution of the mental ages of six-year-old children.

Mental Age	*Number of Children Age Six*
9	1
8	7
7	24
6	36
5	24
4	7
3	1
	100

[6] S. R. Slavson, "Criteria for Selection and Rejection of Patients for Various Types of Group Psychotherapy," *International Journal of Psychotherapy*, 5:3-30, 1955.

[7] L. L. Rashkis, "Meeting the Needs of Emotionally Disturbed Pupils," *Exceptional Children*, 2:272-79, 1957.

This is a smoothed distribution and the numbers are really percentages, inasmuch as they add to 100. Mental age is derived from the application of a mental test which yields a measure of general mental maturity or level of intelligence. Mental age may be thought of as representing a kind of average in the difficulty of all the mental learnings that a child has mastered over his lifetime. A child with a mental age of six can do mental tasks which the majority of six-year-olds can do. A mental age of nine refers to the level of ability possessed by the average nine-year-old, and a mental age of three that of a three-year-old.

Note that 36 per cent (or about one third) of six-year-olds have mental ages of six; 32 per cent (or about one third) have mental ages higher than six, and 32 per cent have mental ages lower than six. Out of 100 first grade children (if they represent a random selection of six-year-olds who have entered the first grade for the first time) approximately one third have the mental ability to do first grade work. But one third are mentally advanced for the work of the first grade, and one third are mentally not ready to undertake the learning in reading and arithmetic which is expected in the first grade.[8] This presents the problem of individual differences which education must in some way solve.

One child out of the 100 six-year-olds in the distribution shown has a mental age of three (IQ 50). Although he has the stature and appearance of a normal six-year-old, his mental development is considerably retarded. His vocabulary is limited to words which denote common objects and actions in his everyday experience, and he has only a rudimentary concept of number. He is unable to keep his attention for long on any one task. He is unsure of himself when asked to compare objects with regard to size, length, or weight and he has only simple conceptions of time relations. A child who has progressed only this far mentally would be unable to profit by the experiences using language and number planned for him in the first grade. For this reason city school systems have arranged that this one child in a hundred should enter a special class for children with retarded mental development. (Indeed, the education of this one child with a mental age of three or less might best be carried on in an institutional setting.) The seven children with mental ages of four would also be placed in this special class.[9]

But what about the one six-year-old child in a hundred who has a mental age of nine (IQ 150). He too has the physical characteristics in terms of stature, motor control, and appearance of a six-year-old. But mentally he is three years advanced. The chances are that when he

[8] Helen Davis found that a mental age of six was necessary to accomplish the work of the first grade in the schools of Jackson, Michigan. "The Use of Intelligence Tests in the Classification of Pupils in the Public Schools of Jackson, Michigan," Chapter III in *Intelligence Tests and Their Uses*, Twenty-first Yearbook of the Society for the Study of Education (Bloomington, Illinois: Public School Publishing Company, 1922), pp. 131-42. Morphett and Washburne present evidence that a mental age of six is necessary for a child to be able to profit from instruction in reading. M. L. Morphett and C. W. Washburne, "When Should Children Begin to Learn to Read?" *Elementary School Journal*, 31:496-503, 1931. And Gates, from his experience, believes that reading may profitably start at different levels of mental maturity according to the school, the teacher, and the methods of beginning instruction, but in his illustrations it is evident that these variations are comparatively narrow and do not depart in general from a mental age of six. A. I. Gates, "The Necessary Mental Age for Beginning Reading," *Elementary School Journal*, 37:497-508, 1937.

[9] In many states a child with an IQ of 75 or below is a candidate for a special class.

enters the first grade he can already read, having taught himself with casual assistance from his parents, and he probably also has familiarized himself with the elementary processes of addition and subtraction, although he may not have mastered them for effective use. He is mentally alert, curious about many things, and has acquired a fund of information about the wider world. He probably has absorbed much information from TV and already has a respectable knowledge of geography, astronomy, and simple scientific facts and principles. For this child, sitting in a first-grade class would be largely a waste of time. Oddly enough, until very recently society made no move to segregate such a child into a special class or school for the gifted. Since this one child in a hundred learns by himself, he is no problem to his teacher, and the school and society are quite content to leave him to his own devices while other children are receiving their first formal instruction in language and numbers. The waste of potentialities of human talent is something that society has become conscious of only in the past year or two, and it is still exploring means for meeting this problem.

What has been said about the one six-year-old in a hundred with the mental development of a nine-year-old applies with almost as much cogency to the seven children six years old with eight-year-old development.

With the passage of time, individual differences become further complicated. This fact is illustrated by the distribution presented here of the mental ages of children at two separate age levels. Note that the largest number of children, 25, have mental ages of nine. Now 37 per cent of the group are one or more years advanced mentally and 37 per cent one or more years retarded. There is a greater spread of individual differences in the nine-year-old group. One might guess that the one child who at age six was three years old mentally is the same child who at age nine is five years old mentally. In the three years he has made two years of mental growth, which is about all that could be expected from a child who in six years had been able to make only half the expected progress. At age nine he is still not ready to do first-grade work.

Mental Age	*Number of Children Age Six*	*Number of Children Age Nine*
13		1
12		4
11		11
10		21
9	1	25
8	7	21
7	24	11
6	36	4
5	24	1
4	7	
3	1	
	100	99*

* The number of children in the nine-year-old group is 99, in order not to disturb the symmetry of the distribution.

But we may also assume that the one child who at age six had the mental age of nine now has the mental age of thirteen, or possibly he is one of four who has a mental age of twelve. In other words, in the three years he has made three or four years of mental growth.

The problem of placement within the group becomes increasingly important as the group becomes older. The nine-year-old with a mental age of five would be hopelessly out of place in the fourth grade—he would still be unable to read or to do other mental tasks expected of fourth-grade children. For him a special class assignment becomes an increasing necessity.

But what about the nine-year-old who has a mental age of thirteen, which makes him capable of doing the work expected in the junior high school? Again he presents no problem in learning to his teacher, but he has become increasingly unhappy and restive, and what a waste of human potential!

In discussions of individual differences it is customary to stress the fact that there are great variations in progress in learning in any individual. One child may have learned to read, but still be very clumsy in running or catching a ball. Another child may be a genius in manipulating numbers, but less advanced in getting along comfortably with other children. One child may be able to read as well as a fourth grader, but in his knowledge of arithmetic may be only the equivalent of the average child in the second grade. Because of these disparities in development it is commonly believed that it is impossible to frame a plan of grouping pupils that will eliminate individual differences.

Grouping children in school, which involves the problem of promotion, is one of the most perplexing issues that education has to face. Let us look at the two possible extremes. One is to promote every child into the next higher grade each year. If children are admitted to the first grade when they are six years old, then all seven-year-olds would be in the second grade, all eight-year-olds in the third grade, and so on. This has the advantage of promoting all children to the next grade each year, where presumably they would move on to fresh topics on a somewhat more advanced level with fresh materials and the additional advantage that friends would stay together, all children in a grade would have the same chronological maturity, and there would be no discrimination because of differences in progress in learning. No child would have the stigma of "failure" which having to repeat a grade commonly carries with it.

But the distribution given on page 90 indicates that the problem of individual differences so far as mental abilities are concerned has increased. Of the 99 nine-year-old children who would be in the fourth grade, 5 cannot read, and 16 would be two or more years retarded. Approximately 37 per cent would have trouble with the reading materials and the arithmetic operations which would normally be provided in the fourth grade. By the time they are twelve years old and ready for high school, about 11 per cent would still be unable to read beyond the third grade level.

Age grading brings together not only pupils who vary widely in mental development (mental age), but also those who differ in their capacity to learn (IQ). The retarded child of nine will continue to progress at a slower rate than most nine-year-olds, while the child who has advanced beyond his age group will continue to learn at a more rapid rate than most children of his age.

But at the other extreme, consider a promotion plan where children are rigorously graded according to achievement as tested by, say, the Stanford Achievement Test. Here individual differences cut in the other direction. While children in any grade would be nearly the same in mental and academic development as it is possible to arrange, they would vary widely in chronological age. The tabulation on page 92 shows how 103 children with mental ages of six (first grade level) and nine (fourth grade level) would be distributed in chronological age.

According to these figures two children are mentally ready to enter the

Chronological Age	*Number of Children of Mental Age Six*	*Number of Children of Mental Age Nine*
15		1
14		2
13		4
12		7
11	1	12
10	2	19
9	4	25
8	11	22
7	23	9
6	36	1
5	24	
4	2	
	103	102

first grade at the age of four, while one child in a hundred would be eleven years old before he is ready to enter the first grade. By the fourth grade (mental age of nine) there is a ten-year span of ages, with one child only six years old and one child fifteen. Naturally this would be an impossible situation in the eyes of most persons, with a six-year-old sitting beside a fifteen-year-old day after day. Such a system would require repeated and extensive so-called "failure" and "being left back," and many parents would be extremely restive at the slow "progress" their children would be making. (Both of these illustrations are extreme, because it is generally accepted today that retarded children will be placed in special classes.)

An interesting observation of the results of promotion strictly by mental age is that there are more retarded overage children (45 per cent) than accelerated underage children (32 per cent). This seems to be a necessary outcome in attempts to classify according to mental maturity.

In addition, even though the children under this plan would have the same level of mental development in each group, there would be extreme differences in capacity to learn. In the fourth grade (all with mental age of nine) one child would have a chronological age of six with an IQ of 150. Since he has developed in six years as much as the typical child in nine years he can be expected to continue to learn more rapidly, even though he is the youngest in the class. At the other extreme the pupil who is fifteen has an IQ of 60, and since it has taken him fifteen years to progress as far as most children have in nine years, the chances are that he will continue to learn slowly, even though he is the oldest in the group.

It becomes obvious that neither of these extremes is acceptable. Promotion plans must of necessity be a compromise between the extremes, making a grade represent roughly a certain maturity of mental development, but being somewhat elastic in this, and not requiring an unduly large percentage of children to repeat a grade in any one year. And this is the promotional plan in operation in most school systems.

In the 1920's, when the possibilities of standardized achievement testing were being explored, many schools adopted a promotional system in which children were graded according to test results. There has been a reaction against this and there is a growing trend toward an age–grade system.[10]

Olson and Hughes[11] have proposed a compromise measure of development which may be used for pupil classification. They have dubbed it "organismic age." This is a composite of not only

[10] R. T. Lennon and B. C. Mitchell, "Trends in Age-Grade Relationships: A Thirty-five Year Review," *School and Society*, 82:123-25, October 15, 1955.

[11] W. C. Olson and B. O. Hughes, "The Concept of Organismic Age," *Journal of Educational Research*, 35:525-27, 1942.

mental age and chronological age, but also scores derived from reading, height, weight, grip, development of teeth and of bones in the wrist. The authors give no evidence as to the correlation of each of these units with school achievement, but presumably the correlation is considerable. One would have to ask, however, how much some of these variables add to a multiple correlation consisting of the composite of mental age and chronological age. This measure of organismic age may be too complicated for practical use, but the reasoning behind the concept of organismic age has merit. Perhaps an average of chronological age and mental age would serve as a usable first approximation to the concept of organismic age that Olson and Hughes have in mind.

The question of grading or sectioning on the basis of ability or progress is tied to the problem of how much variability in one trait persists if pupils are graded or sectioned homogeneously in another trait. This depends on the correlation between the two traits, and this correlation has never been adequately determined. Most of the hundreds of correlations reported in the literature are worthless because they have been computed in grade groups whose composition has not been defined. The only data —and these are now three decades[12] old— giving correlations on single age groups present the following correlations:

r Stanford-Binet intelligence with reading	= .835
r Stanford-Binet intelligence with achievement	= .82
r Stanford-Binet intelligence with arithmetic	= .80

If there were grading such that *all* of the children in a given grade would have a single mental age, the variability in reading would be (only) 40 per cent, the variability in general achievement 42 per cent, and the variability in arithmetic 45 per cent of the total variability which would exist if there were no attempt at grouping on the basis of ability. This may suggest that a considerable amount of variation remained, but this reduction in variability would be worth while and would greatly ease the teacher's burden in meeting the problem of individual differences. Unfortunately a promotional plan in which pupils are graded strictly on the basis of mental age is out of the question for reasons given above.

If one were to grade on an average of chronological and mental age (roughly approximating the organismic age concept of Olson and Hughes), which used to be the practice in the majority of school systems, the correlation between intelligence and other function would become much lower:

r Stanford-Binet intelligence and reading	= .60
r Stanford-Binet intelligence and general achievement	= .58
r Stanford-Binet intelligence and arithmetic	= .55

These correlations correspond closely to those frequently reported in the literature which have been determined on grade groups.[13] If grading follows this pattern, where the reduction in variability in mental age is 50 per cent, the reduction in variability would be 20 per cent for reading, 18 per cent for general achievement, and 17 per cent for arithmetic over the variability which would be present if there were no attempt to

[12] T. L. Kelley, *Interpretation of Educational Measurements* (Yonkers-on-Hudson: The World Book Company, 1927), Chapter 8.

[13] See A. I. Gates, "Correlations of Achievement in School Subjects with Intelligence and Other Variables," *Journal of Educational Psychology*, 13:277-85, 1922, for a set of correlations which has often been quoted.

make a group homogeneous in ability.[14] This leaves a grade at nearly the full variability that one would find in complete age groups, which leads to the conclusion that any practical attempt to make a grade signify a level of ability still leaves pupils in a grade widely dispersed in any given function such as reading or arithmetic. From this, one can justifiably draw the conclusion that grading on any composite of developmental factors is nearly as good as any other plan as far as the reduction of individual differences is concerned.

This is the conclusion reached by Cook nearly two decades ago from empirical evidence.[15] Goodlad had suggested the concept of "continuous progress" to replace the older concept of a grade as meaning a clearly defined level of educational progress.[16]

It is difficult for teachers to realize the wide variability in achievement in any subject, such as reading under traditional promotional practices. Hildreth comments, "As soon as teachers and school authorities more generally realize that individual variability within a single class group is not necessarily a reflection on teaching or administrative efficiency, chagrin and embarrassment will disappear."[17]

Recently the suggestion has been made that annual promotions might be abolished and pupils might remain in the same group for two or three years. As compared with age grouping and annual promotions it is true that this would result in very little increase in heterogeneity in mental development, as the tabulation opposite indicates.

Distributions of mental ages of children eight, nine, and ten years of age are presented in the first three columns. Column 4 presents the distribution of mental ages for ages eight and nine combined. This is obtained by adding across the number for the ages at each mental age, and dividing by two. Column 5 shows the result of combining ages eight, nine, and ten.

At the bottom the numbers of children in each age group having the three mental ages at the center of the distribution are shown. For instance, 72 at the bottom of column one is the total of 22, 28, and 22, being the number of children with mental ages of seven, eight, and nine. It will be noted that the percentage of children in these three center mental ages for two groups combined (64.5) is only slightly less than for the two age groups separately (72 and 67), and when three groups are combined, the sum of the three center mental-age groups (60.6) again represents little loss and indeed is practically identical with the results in the ten-year-old group (61).

[14] These results correspond very closely to empirical results obtained by Hull and Hollingshead. Hull found that variability within an individual on thirty-five standardized tests was 80 per cent of the variability of the class. C. L. Hull, "Variability in Amount of Different Traits Possessed by the Individual," *Journal of Educational Psychology*, 18:97-106, 1927. Hollingshead found that when pupils were classified according to mental age, the reduction in variability in reading was 20 per cent and in arithmetic 18 per cent. A. D. Hollingshead, *An Evaluation of the Use of Certain Educational and Mental Measurements for Purposes of Classification.* Contributions to Education No. 302 (New York: Bureau of Publications, Teachers College, Columbia University, 1928).

[15] W. W. Cook, *Grouping and Promotion in the Elementary School*, No. 2 in the Series on Individualization of Instruction (Minneapolis: University of Minnesota Press, 1941).

[16] J. I. Goodlad, "To Promote or Not to Promote," *Childhood Education*, 30:212-15, 1954.

J. I. Goodlad and R. H. Anderson, *Ungraded Elementary School* (New York: Harcourt, Brace & Co., 1959).

[17] Gertrude Hildreth, "Individualizing Reading Instruction," *Teachers College Record*, 42: 123-37, 1940.

Mental Age	1	2	3	4	5
	Number of Children				
	Age 8	Age 9	Age 10	Ages 8, 9	Ages 8, 9, 10
14			2		0.7
13		1	5	0.5	2.0
12	1	4	12	2.5	5.7
11	3	11	19	7.0	11.0
10	11	21	23	16.0	18.3
9	22	25	19	23.5	22.0
8	28	21	12	24.5	20.3
7	22	11	5	16.5	12.7
6	11	4	2	7.5	5.7
5	3	1		2.0	1.3
4	1			0.5	0.3
	102	99	99	100.5	100.0
N for middle three years	72	67	61	64.5	60.6

The point here is that if a teacher has to adapt instruction to individual differences within the classroom her task is not necessarily increased by combining two or three age groups into one class which would permit that class to stay together for two or three years and also would permit considerable curriculum freedom in adapting to individual differences.

There has been much muddy thinking about the influence of grading practices on the learning process. There has also been implicit in the thinking of educators that retardation (as a result of failing to promote pupils because they did not come up to standards held for admission to the next higher grade) was something that could be corrected by better educational methods. Years ago Ayres called attention to the large number of overage pupils in the grades of elementary schools.[18] Even today one hears that "the prevention of failure is costly, but no more costly than a system of nonpromotion in which both society and the individual lose every time a pupil must repeat a grade."[19]

But there is public reaction against age grading on the grounds that it means an abandonment of grade standards, that "failing" pupils are promoted year after year, and that completion of elementary school has little significance as far as scholarship is concerned. Those who make these strictures are not aware that there is almost as much pupil variability in grades in schools that make a pretense of upholding grade standards as in schools where there is age grading.

Cook reports an experiment in which, of two groups marked for failure and matched on the basis of chronological age, mental age, and reading comprehension, one group was failed (not promoted) on the basis of test results and the other group promoted to the next grade. At the end of a semester there was no consistent statistical difference in the achievement of the two groups.

[18] L. P. Ayres, *Laggards in Our Schools*. New York: Russell Sage Foundation, 1909.

[19] "Pupil Failure and Nonpromotion," *Research Bulletin of the Research Division of the National Education Association*, 37:1:17, January 1959.

That is, "failing" pupils who were promoted—passed on to the next grade—did as well on the average as those who were required to repeat the grade.[20]

An experiment similar in design was carried out by Klene and Branson with similar results. They conclude that "children of normal ability gain more from trial promotion than do children of equal ability from repeating a grade, and children of less than average ability gain little more (without statistical significance) by repeating a grade than they gain by trial promotion."[21]

Then there is the argument that promotion serves as an incentive, and fear of failure can motivate pupils to put forth greater effort and hence to make higher achievement. A number of experimental studies have shown that there is no basis for this belief. Otto and Melby, for instance, in an experiment with second- and fifth-grade classes, presented results which showed that "children who are told at the beginning of the semester that all will be in the following grade the next term do as well on a comprehensive achievement test as children who throughout the semester are reminded that they must do good work or suffer nonpromotion."[22]

These results may seem mystifying to many teachers who believe that the threat of failure is one of the most potent motivating forces in education. But all of the evidence points to the contrary. Failure and the threat of failure are traumatic in their effect, and result in loss of interest and abandonment of effort.[23] Failure is a form of punishment ("wrong"),[24] and while it does not destroy what has been learned, it tends to inhibit further efforts at learning. Sandin presents evidence that "the general outlook of the slow-progress pupils toward school and school life was not as favorable or as indicative of a happy adjustment as that of their normal-progress classmates. Many of them wished to quit school and many were easily discouraged or considerably worried about their future school progress."[25] It is possible that these pupils were unhappy and maladjusted for reasons other than their classification in school, but their school placement did not ameliorate their unfavorable attitudes.

A more recent study by Goodlad reaches the same conclusions. Goodlad made early and late tests of both social and personal adjustment and found that pupils who were repeating a grade deteriorated in their attitudes during the year, which lends some support to the belief that nonpromotion itself has a negative influence on adjustment.[26]

What are the favorable conditions for learning in school? Stated simply, learning takes place most effectively when pupils are presented with learning opportunities in the form of material and tasks for which they are ready, when they are rewarded for making appro-

[20] W. W. Cook, *Grouping and Promotion in the Elementary School*, p. 46.

[21] Vivian Klene and E. P. Branson, "Trial Promotion versus Failure," *Educational Research Bulletin of the Los Angeles City Schools*, 8:5:6-11, 1929.

[22] H. J. Otto and E. O. Melby, "An Attempt to Evaluate the Threat of Failure as a Factor in Achievement, *Elementary School Journal*, 35:588-96, 1935.

[23] Evidence for this was reviewed by Symonds in article VI of this series, "Emotion and Learning."

[24] See article III of this series by Symonds, which deals with punishment.

[25] A. A. Sandin, *Social and Emotional Adjustments of Regularly Promoted and Nonpromoted Pupils*. Child Development Monographs No. 32 (New York: Bureau of Publications, Teachers College, Columbia University, 1944).

[26] J. I. Goodlad, "Some Effects of Promotion and Nonpromotion upon the Social and Personal Adjustment of Children," *Journal of Experimental Education*, 22:301-28, 1954.

priate responses, and when they are meeting the expectations of their teacher and their expectations for themselves.

Failure and the repetition of a grade do not provide any of these conditions. If a pupil fails to master the work of a unit with his classmates, then of course he should be given another opportunity; but if he failed the first time there is no reason to believe that he will succeed by mere repetition. Something must be changed. He must be given a chance to learn from fresh, unfamiliar material, or the methods of instruction must be changed. Perhaps he would learn better with a different teacher. Probably he needs more detailed explanation or closer guidance. Somewhere he failed to comprehend a term and as a result made an inappropriate response. The emphasis should be on remedial instruction instead of nonpromotion.

Since there is no plan of promotion and pupil classification that eliminates heterogeneity in the different abilities in which the school is interested, one must reach the conclusion that the responsibility for dealing with individual differences rests with the classroom teacher, and this indicates that the problem in modern education is not unlike that of the teacher in the one-room school of the past. Variations in the management of individual differences within the classroom have not been extensively studied by psychologists, and consequently there are few definitive suggestions regarding this management. The following proposals are quite general and are derived more from logical and common sense considerations than from the results of precise tests of the outcomes of different methods.[27]

It seems obvious that it becomes necessary for the teacher to initiate grouping within her class. If this is to be done meaningfully, it must be based on knowledge of each pupil's abilities and his achievement status in each subject of study. This means that a teacher who wants to form small groups for special instruction in reading or arithmetic not only should have available the results of achievement tests given at frequent intervals, but must herself be prepared to give diagnostic tests that will indicate the achievement of her pupils in the different subjects. Teachers frequently feel that they know where a pupil stands in his progress by having worked with him, but these impressions are often influenced by the pupil's cooperation, likeableness, and other extraneous factors, and the teacher's impressions need to be verified by more objective measures of progress.

Meeting the problem of individual differences in the classroom requires considerable flexibility on the part of the teacher. Pupils will not necessarily be in the same groups in different subjects. If some pupil is more advanced in reading he would work in one group in arithmetic and another in reading. And the wise teacher is ready to change the composition of these small groups from time to time as pupils make spurts in their learning or require special help on some topic.

The very fact that a teacher must give her attention to a small group which is a fraction of the class means that many pupils must work individually and alone. Workbooks which provide exercises on which pupils can work by themselves in the solution of problems, individual reading instruction, or material of a more

[27] A helpful survey of methods that the teacher may use to take care of individual differences in reading in the classroom may be found in Hildreth, *op. cit.* Subgrouping of pupils is at the top of her list of suggestions.

creative nature are now available in every subject of study. However, *pupils have to be taught how to work alone.* It is not sufficient for a teacher to place an exercise book before a pupil and say to him that he is to work these problems while she is busy with some small group. Pupils need definite instruction and guided practice in how to follow directions, use illustrations, transfer the problem to work sheets, and all of the other small details that are involved in working alone. The learning machines, introduced by B. F. Skinner[28] and mentioned in the article on "Reward" of this series, will be an aid to the teacher in meeting the problem of individual work, but they will also create new problems in individual differences because some pupils will learn much faster than others, and the introduction of devices that permit pupils to progress at their own rate will really magnify the problem.

But working alone is not the only alternative to working in a group under a teacher's direction. Pupils can be taught how to work in small groups not under the teacher's immediate direction. They can be taught the art of joint attack on a problem, of mutual assistance, and of group discussion of difficulties.

It should also be emphasized that not all of the time in school should be spent in small group or individual activities. There are occasions when the class may work as a unit, as in the planning of some class project, in the discussion of some topic of current interest, or in some group activity such as singing or listening.

As one passes from elementary to secondary school the problems of individual differences are both increased and decreased. The extent of individual differences increases with increasing age, which means that adjustment to them becomes increasingly important on the secondary school level. But there are also compensatory factors. Differentiation of curricula makes it possible to separate students not only on the basis of ability, but also by interest and motivation. Departmentalization of studies makes it possible to section within a subject without having to keep a class together in all subjects as is the case in the traditional elementary school, but this creates difficult problems of scheduling for the high school principal.[29]

In conclusion, briefly, individual differences in learning require attention to the problem of how pupils shall be brought together in groups. Evidence has been presented to show that attempts to classify pupils homogeneously on any one basis create problems with respect to other factors; and in any compromise plan pupils in a class will vary almost as much in any one skill or subject as they would if there had been no attempt to make a group or grade stand for some level of progress. One is forced to reach the conclusion that, whatever the system of classification and promotion of pupils, the major responsibility for adapting instruction to individual differences rests with the classroom teacher.

[28] *See* also B. F. Skinner, "Teaching Machines," *Science*, 128:969-79, 1958.

[29] Actually grouping by subject has been suggested and tried in the elementary school. *See* D. H. Russell, "Interclass Grouping for Reading Instruction in the Intermediate Grades," *Journal of Educational Research*, 39:462-70, 1946.

Traffic Safety, the Driver and Electronics

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OF ALL the possible causes of traffic accidents, the driver gives us most concern. Authorities claim he is responsible for 80 to 90 per cent of all accidents [19]†—some would say as high as 96 per cent. [1] Much time and money have been spent to improve driving behavior. Statistically these attempts have been reasonably effective. Some of them hold good *long-range* promise for reducing accidents. There is reason to believe, however, that significant *immediate* progress can be made through automatic devices and systems which will influence or substitute for the driver.

A THEORY OF DRIVER BEHAVIOR

During the past thirty years investigators have searched for characteristics common to drivers in accidents. Their search has ranged from single measurements of vision, hearing, depth perception, and reaction time to analysis of subtle personality differences. But their findings have been disappointing. In almost all instances, the relationship of these characteristics to accident frequencies has been slight, because driving is a highly complex task. Consideration of this task and the many forces which influence it (for example, compensations—the older man making up in judgment what he lacks in reaction time) suggests that driver behavior at any moment is a point on a continuum, with safe driving at one end and unsafe driving at the other.

The initial position and stability of this point are determined largely by the characteristics of the individual. Some of these have a constitutional basis; others develop over time. Most are a combination of both. Examples are (1) physical characteristics such as age, size, sex, and condition of the body; (2) physiological characteristics such as sensory discriminative capacities, perceptual abilities, response capacities, and central and autonomic nervous system functioning; (3) intellectual characteristics such as the ability to learn, comprehend, remember, and judge; (4) personality characteristics such as basic emotional adjustment, motivation, attitudes; (5) social characteristics such as role in society and socio-economic level; and (6) educational characteristics such as formal and in-

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† Figures in brackets refer to items in Bibliography, p. 110. The number after a colon is the page reference.

formal driver training, and appreciation of the traffic safety problem.

In constant interaction with these characteristics are hundreds of forces, usually transient, which relate to a particular driving episode. Examples are the behavior of other drivers, presence of enforcement officials, signals, flow of traffic, and conditions and characteristics of both highway and vehicle. Also influencing the driver are such factors as where he is going, how much time he has to get there, what he has been eating and drinking, how he is feeling, what he is thinking about, looking at, and listening to, and his immediate relationship with his passengers, his wife, his boss, and other persons important in his life.

As these forces interact with one another and with the characteristics of the individual, they may move the point representing driver behavior toward the safe or the unsafe end of the continuum.[1] Forces moving the point toward the safe end are positive; those moving it toward the opposite are negative. Forces which move the point only slightly are weak; those which move it considerably are strong.

The position of the point on the continuum differs markedly among individuals. For some drivers it is so close to unsafe that a minimum of negative forces makes them dangerous. For others, the point is far enough from the unsafe end that even considerable negative forces might not be harmful. The position of the point may also vary markedly in a person from day to day (he may be unusually fatigued or emotionally upset), or even from moment to moment when strong forces like alcohol or drugs are operative.

But most important is the understanding that for each driver, the unsafe end of the continuum can be reached. When sufficient negative forces are operative, no one is immune to unsafe driver behavior.[2]

Within the theory of driver behavior, two approaches to the reduction of accidents suggest themselves: (1) influencing the characteristics of the driver and the many forces acting on him so that his behavior will be closer to the safe end of the continuum; (2) developing and utilizing automatic devices and systems that signal the approach to the unsafe end and actually take control of the vehicle if the driver fails to heed the warning.

CHARACTERISTICS OF THE DRIVER

Correcting physical and physiological defects, and influencing attitude, personality, and education are means to improve driver behavior. While many good programs exist, much needs to be done.

First, there should be a systematic plan for rewarding good driving. It is unfortunate that enforcement seems synonymous with punishment. Certainly psychology has established that reward is a highly effective and more lasting influence on human behavior.

Second, while it has been shown [22] that formal courses in driver education produce better driving records, there are indications that a better job could be done. One of the important elements seems to be the teacher. We need to de-

[1] Some characteristics and forces are so interrelated that assignment to either category is arbitrary. In general, characteristics are inherent in the driver and more or less permanent, while forces originating outside the driver are more transient.

[2] This theory parallels a phenomenon in chemistry. Elements and compounds have different melting points. From element to element and compound to compound the range of melting points is great, yet there is not a known substance that will not melt or decompose under sufficient heat.

termine the competencies of successful teachers, then set standards for selecting and training them, thereby improving the courses. How best to teach perception and judgment, how to determine the value and nature of the retraining of drivers are other areas to be explored. In addition, the benefits of some proved [16] educational techniques for influencing behavior—group-discussion decision for example—have hardly been noticed.

Third, we need to know more about anxiety. Most of us are aware of the ineffectiveness of "safety by the ton." Almost daily we witness the weakness of scare technique, which may range from gruesome pictures in the newspapers to radio and television warnings that you may never get there alive. A certain amount of anxiety (fear) is desirable for the learning process; too much decreases the learning probability. What is the most effective amount and how should it be conveyed? The answer would be particularly helpful for mass communication.

Finally, we must learn more about identification and emulation as influences on attitudes and behavior relating to traffic safety, particularly for children in relation to parents, teachers, policemen, coaches, other authority figures, and neighborhood gangs. Albert Schweitzer said, "Example is not the main way to teach, it is the only way."

I believe that these programs hold promise, and I have discussed them elsewhere at greater length.[17] But programs which hope to modify the personality and attitude of the driver face a dilemma. The significant personal characteristics seem to be so highly personal that it is uneconomical at best, and perhaps hopeless, to do anything about them for the limited purpose of improving driver behavior. The important characteristics usually have deep roots in all areas of the driver's life. How realistic is it to hope for change? In addition, changing personality and attitudes takes much time and effort—more than the urgent traffic safety problem permits us to spend.

Besides, educational programs in particular have other limits. One of these is imposed by the fact that some transient forces can override or dilute the influence of education. For example, a person intoxicated beyond a defined degree no longer uses either his education or his judgment. Fatigue and severe emotional stress exert much the same influence. A recent study [5] showed that from 1950 to 1957, 49 per cent of the drivers killed in single car accidents in Westchester County, New York, were legally drunk (0.15 per cent by weight of alcohol in the heart blood).

This statement of limits is in no way meant to discredit attempts to influence driver characteristics. The human being as a biological and physiological entity does not change much; in the long view he may be the most constant factor in the driving situation. Improved understanding of his characteristics and methods for influencing them will eventually yield beneficial results. We have, after all, many huge educational systems and institutions based on this premise. In addition, research into human characteristics is seldom wasted. The results may be valuable outside of or in addition to the areas scrutinized. Nevertheless, influencing the characteristics of the driver is a *long-range approach to accident reduction.*

FORCES WHICH ACT ON THE DRIVER

Though some critics [21, 20] would take issue, let us assume that automotive

engineers, highway engineers, and traffic engineers are doing their best to improve traffic safety through the design of automobiles, highways, and traffic systems. This will leave primarily psychological forces to discuss.

A recent television show implied that a man caused a traffic accident because he was worried about his job. Worry may have contributed to the accident, but did it *cause* it? Thousands of drivers who do not have accidents are also worried about their jobs. Other forces must have been involved. An analogy from chemistry comes to mind. There is a technique called titration which is used to measure the concentration of an unknown substance. First an indicator is added to the unknown; then a known substance is added *drop by drop*. When the indicator changes color, computations establish the concentration of the unknown. The tendency might be to say that the last drop was the most important, because it produced the color change. Actually all drops were important. We sometimes isolate and credit a force with causing an accident simply because it was last in sequence, whereas in reality it was one of many contributing forces.

One authority refers to the "last drop" as the "trigger episode." In his own clinical analysis of accidents he has assembled no fewer than 250 different characteristics and forces contributing to accidents. He concludes that the "trigger episode . . . is but the detonation of a far more powerful surcharge of etiologies." [25:168]

Of the many psychological forces acting on the driver, which are the more important? And which are controllable in any systematic fashion? Suppose it is found that a strong negative force is an argument with one's wife. How do we go about preventing arguments and other negative forces? I assert that most of the forces interact with one another and with characteristics of the driver so completely that they are effective only as a composite, and that any attempt to isolate specific forces in accidents is largely a waste of time. This is one reason why it is unlikely that a "psychological vaccine" for immunizing against traffic accidents will ever be developed. Vaccines are limited to providing immunity to a specific agent.[3] Nevertheless we look forward with interest to the results of the studies conducted at the Traffic Institute of Northwestern University and the Harvard School of Public Health, especially to what will be revealed about the causes of accidents, particularly about the driver.

[3] There are some interesting parallels between susceptibility to poison ivy and unsafe driver behavior which end with developing vaccines for immunity. Recent studies (Albert M. Kligman, "Poison Ivy (Rhus) Dermatitis: An Experimental Study," *American Medical Association Archives of Dermatology*, 77:155, 158-59, February 1958) establish that no one is immune to poison ivy. Mildly sensitive persons can withstand average, casual exposure to the plant. But the minutest traces of sap will cause a dermatitis in highly sensitive people. Several subjects who thought they were immune were brought to grief when, contrary to advice, they rubbed themselves with leaves and even chewed them. The study also established that sensitizability varies markedly not only among persons, but even in different periods of the same person's life, and while there are unknowns related to susceptibility, the degree of exposure within a certain time span is most important. Obviously what is needed to protect against poison ivy is knowledge of the plant so that it can be avoided, and a vaccine to immunize against its effects. Such a vaccine is being developed. Here the parallel ends, for exposure to accident situations is so great in America—with seventy million cars on the road—that advice to avoid accident situations is gratuitous, and a vaccine to immunize against the complexity of forces which produce unsafe driving is very unlikely.

NORTHWESTERN AND HARVARD STUDIES

Thus far most programs to improve driver behavior have been based on limited research, the inclinations and best guesses of safety professionals, and insights derived from many disicplines related in one way or another to traffic safety. No large-scale depth studies have been made of the causes of traffic accidents.

About a decade ago epidemiologists [4] became actively interested in traffic accidents, which are said to be somewhat like disease: the host is the driver, the agent is the vehicle, and the environment is largely highway and traffic conditions. The Northwestern and Harvard studies use the epidemiological approach and an interdisciplinary case study technique. A physician, a psychologist, and an engineer go immediately to the scene of an accident and thoroughly investigate the causes. The psychologist and the physician examine the vehicles, observe the road situation, and within days after the accident interview the persons involved and examine their mental and physical status. The engineer observes the road situations and vehicles at the scene and conducts post-accident investigations. A consolidated report is made. The studies will include intensive investigation of approximately 1,000 traffic accidents.

Although these studies are carefully planned and come about as close as is possible to discovering the *causes* of accidents, yet some of their own designers recognize important limitations.

1. Since the case study is ex post facto, definite demonstrations of causes can rarely be made with a high degree of confidence. [9:26] Furthermore, direct questioning at the scene of an accident is difficult because of stress or trauma, and answers that are obtained are usually fragmentary. [10:16]

2. There are hundreds of possible causes in interaction with the driver, the car, and the road. Even if a group small enough to be meaningful can be isolated from a particular accident, it is doubtful that these same causes will interact again to produce an accident. Such groupings therefore have little *preventive* value. [9:15]

3. A depth examination of all possible causes can consume much time. One of the classic examples of the case approach is the Civil Aeronautics Board Report made for some of the spectacular commercial aviation accidents. These are narratives based on intensive and sometimes ingenuous investigations. As many as ten to fifteen man-years may be spent looking into a single accident. The Board then designates a "probable cause." [9:45] Obviously so much time cannot be devoted to traffic accidents, but how much can the investigative depth be reduced and yet be meaningful?

It seems likely that the Northwestern and Harvard studies will produce more of value in relation to the car and the road than to the driver. Man will probably emerge as the chief factor in accidents, and the least predictable. Further studies of driver characteristics will undoubtedly be recommended, and although the field of investigation will have been narrowed, a long, hard task will still be ahead.

My intent is not to disparage the ultimate utility of these studies. They will help sort out the more important causes of accidents and give us insights into how these can be combatted. My intent is to emphasize that the results of these studies are largely long-range. *We need more immediate solutions.*

IMPROVEMENTS IN THE VEHICLE

The difficulty of doing something immediate about the driver has led many persons to concentrate on improvements in the vehicle and the road. The most significant vehicular activity, which is called "packaging," has received the active interest and endorsement of epidemiologists.

There are two collisions in an accident: one is the collision of the vehicle with another object, usually a vehicle; the second is the impact of the riders against the interior of the vehicle. It is the second collision which is directly responsible for damages or death to driver and passengers. On the basis of carefully regulated studies [2, 3] it might be estimated that if cars were constructed for proper packaging, as many as 75 per cent of the fatalities could be reduced to injuries. Proper packaging, as it has thus far been developed, includes: (1) doors which will not open on impact; (2) seats and cushions which will not become displaced on impact; (3) energy absorbing interiors; (4) adequate devices to keep people in their seats on impact.

Improved packaging should be developed, endorsed, and built into automobiles, perhaps even on a compulsory basis. It will doubtless reduce fatalities and the severity of injuries suffered in accidents. During 1957, however, in addition to 38,500 fatalities, there were 1,400,000 injuries (5,000,000 if one accepts the United States Public Health Service figures) and at least $5,300,000,000 in economic losses due to traffic accidents. [23:13 and 40] Hence the phenomenally high and sometimes prohibitive auto insurance rates. And while fatalities per vehicle mile are decreasing, injury rates and economic losses are on the upswing.

With engineering wisdom we might go a step beyond packaging and try to *prevent* accidents. Epidemiologists are *preventive* specialists. Why should they limit themselves to the prevention necessary *after* the accident, especially when automatic devices—in fact entire automatic systems—can prevent such accidents. [26]

IMPROVEMENTS IN THE ROAD

Traffic engineers, highway engineers and planners work toward accident reduction through improvements in the road. In the past decade they have made considerable strides. The major approach of traffic engineers is through improved traffic flow and control. There are few universal forces as powerful as bumper-to-bumper traffic to push the driver toward the unsafe end of his continuum.

Highway engineers strive to improve the technical features of the road; for example, they would eliminate crossroads. They have to get much highway out of the highway-building dollar. Both highway and traffic engineers are interested in improvements which do not interfere with traffic flow or introduce prohibitive costs into highway construction. They are also interested in safety which does not interfere with the basic social purpose of the motor vehicle—transportation of people and goods and services as rapidly as possible.

Automatic devices to improve traffic flow are already in use and increasing daily in number. (The City of Baltimore has electronic counters, routers, and signal changers.) But the highway engineers have not been so interested in automatic devices for safety as one might expect. They seem to overlook the converse of improved safety through improved traffic flow: improved traffic flow through improved safety. (Accidents do not do

anyone's traffic flow any good.) And once in a while they team up with automotive engineers in some unfortunate oversights in design leading to such conditions as "highway hypnosis" and "velocititis."

HIGHWAY HYPNOSIS AND VELOCITITIS

On expressways, hypnotism has joined the do-it-yourself projects. Staring fixedly ahead at a monotonous road for long periods while being lulled by the hum of engine and tires, and barely having to move the steering wheel, soon induces a condition resembling hypnosis. Along with hypnosis goes velocititis, a condition which arises from sustained high speed. After a half hour or so on a turnpike, one may lose concept of speed and space; 60 mph feels like 45. To slow to 25 mph for an exit ramp can feel somewhat like stalling the engine.

The automotive engineers in designing for comfort and ease of driving, and the highway engineers in designing for traffic flow, have in large part created these two hazardous conditions, but they have turned them over to others to solve and the results are unfortunate. Suggested methods [11:5] to overcome the forces inducing highway hypnosis are:

Sing. Whenever you feel bored or sleepy, start singing at the top of your voice.

Chew a pack of gum. Most folks are content with a stick or two at a time, but as a hypnosis antidote, chew a big wad—a full pack or at least a half pack.

Take off your right shoe. Many drivers find the vibration of the gas pedal stimulating enough on a stocking foot to be helpful.

Take a whiff of smelling salts. One or two whiffs will snap anybody awake until he can reach a safe pull-out point. Some get the same results from taking half a lemon.

Sit on something hard. A few magazines, or even a piece of thin plywood, make a refreshing change from a soft cushion.

Hypnosis results from a reduction of the total stimuli received from both inside and outside. To avoid hypnosis the number of stimuli should be increased. In a car on a highway this must be done automatically. The devices to do it should be built into the car, perhaps in association with the road. *The engineering wisdom which gives us progress must build into the situation the solutions to the problems the progress creates.*[4]

AUTOMATIC DEVICES

While the approach of automatic devices is new, it does promise immediate reduction of accidents. The devices might range from those that warn the driver to those that take control if he fails to heed the warning, or that automatically substitute for him. Overloading of electric wires is guarded against by circuit breakers and fuses. The human body also has its fuses. If a person attempts to exceed the capacity of his body to perform, his respiratory center renders him unconscious. Why cannot driver behavior also have its fuses?

The fuse concept fits well the possible function of automatic devices. If the skills and coordinations necessary for driving can be determined, so can the

[4] When it was discovered by bread manufacturers that white bread sold more readily than brown bread, flour was bleached. But when it was realized that major nutritional ingredients were lost in the bleaching, the bread companies did not ask educators to train the consumer to put the ingredients back in, they took that task upon themselves. We do not train consumers to pasteurize milk. This is done before delivery. We do not ordinarily train people to boil their own drinking water. Purification is accomplished before the water reaches them. Why do we expect to train people to remedy situations caused by deficiencies in automotive and highway design? Why should not these remedies also be built into the products?

minimum levels at which these should exist for safety. Devices can then be developed to warn the driver of danger. If he fails to heed these warnings, control can be taken from him. If his "fuse" is bad or "burnt out" before he attempts to drive, operating the vehicle will be automatically impossible.

In measuring skills and coordinations, several directions are possible. One is vehicle control responses. Typical of these are: (1) frequency, amplitude, and speed of brake application and steering wheel manipulations, and (2) frequency, amplitude, and speed of accelerator adjustment. Wheel correction movements are illustrative of automatic devices at work. No matter how perfect the engineering of car and road, a certain number of appropriate steering wheel corrections per driven distance are essential. It is possible to design a mechanism that would slow down and halt a car unless the appropriate corrections were made. This would minimize accidents due to heart attacks, falling asleep, and intoxication.

Another possible measure is tension responses. Typical of these are: (1) strength of the driver's grip on the steering wheel; (2) measures of the psychogalvanic reflex, possibly taken from the steering wheel itself; (3) heart rate measures. Automatic devices triggered by pre-specified values of these measures might provide warnings of personal reactions a driver is otherwise unaware of, or they might relieve him of control. Several other measures are not easily classified—for example, frequency and magnitude of head movements, and breathing cycle characteristics, to name two. Hand tremor is another. Suppose it is discovered that the intoxicated and unsafe driver suffers hand tremor to a defined degree. It is a simple matter to develop an electronic ignition switch incorporating a maze pattern that will prevent someone with an excessive hand tremor from starting a car. It would be an added advantage if hand tremor were found to be characteristic of all unsafe drivers. And if some critical index like this did appear, it would illustrate the effectiveness of automatic devices. There would be no moralizing, no attempt to influence the driver's personality or any other part of his life. In effect, he would be told that, whatever the reason, he was demonstrably incapable of safe driving and therefore was not permitted to drive. The operation of the devices would be determined by demonstrable driving skill alone.

CRITERIA FOR SAFE AND UNSAFE DRIVING BEHAVIOR

In addition to providing data useful for developing automatic devices, a determination of the needed driving skills can help establish performance criteria. Traffic investigators have not devoted sufficient effort to devising valid and sensitive measures of driver performance, especially in view of the unreliability of the accident criterion. (A particular type of behavior may or may not result in an accident, and if it does it may not be reported.) Performance criteria[5] are fun-

[5] In addition to performance criteria (absolute minimum demonstrable skills needed to operate a car anywhere, anytime) situational criteria (flexible skills applied to particular situations) are needed to evaluate driver performance at the attitudinal, conceptual, perceptual, and judgmental levels. The latter lend themselves to pencil and paper tests through which a wide range of driver behaviors can be evaluated and predicted without physical danger. The research group with which the author is affiliated is currently attempting to establish situational criteria by using a critical incident technique—asking authorities to describe incidents of good and bad driving, and distilling from these descriptions a criterion for driver behavior.

damental for the advancement of many safety projects.

As promising as they are, however, automatic devices cannot prevent all accidents. Furthermore, the coordinations and skills on the basis of which they are developed change with each change in the technique of operating an automobile. For example, the skill needed to operate a clutch and shift gears is no longer universally necessary. Even though no significant changes in operational methods have taken place in the last four decades, there are indications of some in the offing. General Motors has an experimental car (Firebird III) which replaces the steering wheel, throttle, and brake pedal with a single control integrating all three. The control stick is moved sideways to operate the steering, forward to control acceleration, and backward to apply the brake. [8:118-19] If some version of this car reaches the mass market, operational skills will certainly have to be redefined.

An assignment given the vice-president of an oil company was to predict petroleum consumption in the United States a hundred years from now. About one-half of refined petroleum products is used by automobiles. The oilman said he believed that very little, if any, petroleum would be used for automobiles fifty years from now. In the near future, cars would be electrically powered. He explained the relative ease of developing electronic control devices for electrically powered cars because of the same power source for both systems. The *New York Times* recently gave some support to his prediction. Two electric cars will be in production within a year, and they will alter the driving task appreciably. [7] Ironically enough, just as research[6] is setting out to determine the skills needed in driving, the operational processes show signs of change. This emphasizes the necessity for thinking ahead. While we are seeking solutions to current problems, we must also project five, ten, fifteen years from now and consider what types of vehicles we shall have and how we shall drive them. Only as we visualize the future can we hope to keep our solutions abreast of the problems. And so with automatic devices: though they can help immediately in accident reduction, the outlook is necessarily short-range. All the more reason to get the research needed for these devices underway at once. With luck, mechanisms should be ready within one year after measurements have begun (and there is every indication that cost is feasible).

ELECTRONIC SYSTEMS

We must also look into the potential for comprehensive electronic systems to supplement and ultimately substitute for the judgment of the driver. There seems little doubt that the tools for the electronic control of traffic are now in the hands of scientists and technicians. Indeed, some remarkable progress has been made.

When various proposed systems are examined, the relation of electronic traffic control to highway engineering is at once clear. With the exception of a radar-like device already tested by the Bendix Aviation Corporation, which offers collision protection through apparatus installed within the vehicle, all the approaches call for electronic installations in and along the highway. Some

[6] The writer and his associates have established a research design for an analysis of the coordinations and skills needed for safe driving. Instrumentation for measurements has already been suggested to design engineers, and some large-scale cooperative enterprise should be underway by the time this article appears.

involve complementary equipment in the car itself. The Bendix proposal has the merit of being almost immediately available. Thus it offers an aid to safety as soon as quantity manufacture appears feasible. The device is described by the Benedix research laboratories [15:25-29] as emitting a beep-beep warning sound when the car approaches another car or object ahead. The intensity of the signal varies directly with distance from the hazard. Tests have shown its special value in conditions of fog, darkness, poor visibility, or driver inattention and fatigue (highway hypnosis). It warns the driver in time for him to take appropriate action, but it can also be designed to take control from him by acting on the braking system.

Other proposals, all involving highway installations, are being considered for a program of much longer range. Systems can be longer-lived than the devices we discussed, because they largely involve keeping a vehicle safely placed laterally on a road, and preventing collisions—two characteristics of the driving situation not likely to change as quickly as the manual techniques needed to operate a car.

The basic system described [27:5-15] by electronics scientists with the Radio Corporation of America utilizes a cable and inductance loops buried in the highway. The loops, actuated by passage of any car over them, can perform several functions. The installation in its simplest form actuates a series of lights at the side of the road. Lights *behind* the car will serve to warn vehicles following in the same lane (especially useful in fog and under other conditions causing poor visibility), while lights actuated *ahead* of the car will signal its approach to oncoming traffic (of special significance around a curve or over the crest of a hill). This type of warning requires no equipment in the car. To proceed a step further, rear-end collisions (a major problem on turnpikes) can be averted. The *following* car is equipped with a receiver which will be excited by a "flying tail" of electronic warning signals emitted from the roadway under the influence of the vehicle *ahead* as it passes over the loops buried in the highway. These signals will be translated into visual or auditory warnings in the rear car, varying in intensity with proximity to the car ahead. Thus the driver gets his warning from the dashboard of his car, rather than from lights along the roadside. This has the obvious advantage of being uninfluenced by weather conditions and poor visibility.

As for the cable buried in the roadway —running down the center of the traffic lane and carrying a high frequency current—it can influence sensing devices mounted on a car to warn of the vehicle's deviation from the center of the lane. It will actuate an indicator within the car.

As a final stage, both the "flying-tail" system and the guidance cable *can completely take over operation from the driver. The former can act upon the accelerator and brake to prevent collision; the guidance cable can rectify deviations from the center of the lane through the car's steering mechanism.*

This summary description of the principal systems being studied does not cover the many variants possible for greater refinement in traffic management and in supplying information to the driver. For instance, the existence of a high-frequency carrier current in the guidance cable could permit voice communication to the driver without any addition to the road installation. Thus the driver may be informed of route num-

bers and other pertinent data in approaching an intersection, or receive warnings with respect to weather conditions, unfavorable roads, or other hazards along the route. Similarly, the detectors may serve as traffic counters and speed controllers. The driver may be informed that he is speeding. Other functions can influence the timing of traffic lights proportional to traffic flow. Merely by reducing congestion and regulating traffic flow it is likely, the traffic engineers point out, that a significant measure of additional highway safety can be achieved.

Experts expect that the first use of the highway-to-car electronic systems will be on controlled-access highways such as turnpikes, with the driver returning to manual control and conventional operation upon leaving such a highway. Installations along rural highways without limited access are seen as in a more remote future. Urban applications present special problems of their own.

For these reasons, compatibility of equipment for different circumstances becomes a paramount factor in any devices and systems put into use. The non-equipped car must not be at a disadvantage for conventional operation. The equipped car must maintain its versatility for conventional operation on highways not yet converted to electronic control. Finally, any device, whether in car or road, must have "fail-safe" attributes of proved dependability.

Actual installation of the highway equipment is not seen as a major problem. As for equipment within the car, it has been suggested that until automobiles are electronically equipped at manufacture, detachable devices could be affixed when a car enters an electronically controlled turnpike, for use while traveling along it. Admittedly there will be a long period before all cars or all highways are equipped.

The development of suitable devices and systems can safely be left to the electronics engineers and technicians; but these specialists cannot provide all the solutions, for they cannot envision all the needs. Clear-cut definitions[7] of the various traffic and safety problems (and some answers) must come from highway and motor vehicle administrators, automobile manufacturers, enforcement officials, legislators, highway and traffic engineers, safety specialists, physicians, psychologists, lawyers, and from the highway users themselves. The evidence is convincing that electronic systems hold a high potential for reducing traffic accidents. Every effort must be made to encourage, support and broadcast the results of research for the most rapid realization of benefits.

SUMMARY

Driver behavior at any moment is a point on a continuum which has safe driving at one end and unsafe driving at the other. The characteristics of the driver and the forces acting on him determine the position of the point on the continuum. Unfortunately, if experience is a guide, influencing the characteristics of the driver is difficult and takes a long time. This does not mean, however, that the approach is fruitless. Long-range it

[7] The American Association of State Highway Officials, and the Highway Research Board of the National Academy of Sciences have appointed interdisciplinary committees to explore the problems involved, particularly the research aspects.

Teachers College, Columbia University, is sponsoring an organization to encourage exploration of electronic techniques for improving traffic safety. Its primary functions are the cross-education of the many specialists, and keeping public and legislative information and support abreast of progress in research.

may yield great value, and scientific research will continually narrow the field for study. In addition, good research on human characteristics is seldom wasted, because the results usually provide insight into social problems beyond those specifically considered.

The forces which act on a driver are complex and interact with one another. Isolating one to assess its role in an accident might not be possible. However, as research progresses, it might be possible to sort out from the larger volume significant groups or constellations of forces. This too will take time. Eventually we will succeed, but meanwhile we continue to experience human suffering and a shocking waste of life and money. *Traffic accidents must be reduced now.*

In recent years, electronics has made dramatic strides and in many instances has been able to deal with problems in a new dimension. Once the coordinations and skills needed in driving have been determined, and the major accident patterns identified, it is expected that electronics will have the same success with respect to traffic accidents.

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REVIEWS

Edmund deS. Brunner, David S. Wilder, Corrine Kirchner, and John S. Newberry, Jr., *An Overview of Adult Education Research*. Chicago, Adult Education Association of the USA, 1959. 273 pp. $4. ($2. to AEA members)

The growth of adult education *as a teaching discipline* has been inhibited by the simple lack of anything unique to teach —or the lack of perception of such knowledge, at any rate. History it has, but inseparable, without violence, from that of the institutions and associations that sponsor it. Methods it has, but not a monopoly on them. At every edge it shades off into social work, social science, therapy, or the common world of intellect. To become a discipline it must have focus; to become a science it must generate research.

In this light, the publication of *An Overview of Adult Education Research* is probably the most important event in the history of adult education since the founding of the first national association in its behalf, more than thirty years ago. For some time at least, this book will be the hub of the wheel on which our teaching of adult education will revolve, although each teacher may choose different spokes to relate it to the rim.

Confining their scope to non-credit and non-vocational education alone, the authors, confronted with some 5000 titles of possible use, considered about 3000, eliminated half of those, and then annotated the rest. Rejecting agency types and subject-matter fields as unwieldy, they chose to focus on the adult student (learning, motivation, attitudes, interests, participation) and on the problems of the educator (organization and administration, programming, methods, leadership) and of education at large (institutions, research, and evaluation). They next tried to weed out purely descriptive accounts of single programs or localities whose transferability to other situations was untested; and to concentrate on "the search for useable generalizations." After such massive exclusions, the wonder is the amount they still had that was worth consideration.

It was inevitable that the sources would be overwhelmingly in the fields of sociology and social psychology: inevitable not only because of the background of the authors, but because that is where most research is done that has any relation to the educational process in society. For many reasons, not many educators of adults are engaged in research.

At the same time, the reader is naggingly aware of sources outside the purview of the psychologists and the Cooperative Extension Service from which research ore could have been mined. The whole field of psychiatric research into the nature and sources of "favorable change" (that is, learning and attitude-formation) is left untapped, as is recent work on evaluation by the behavioral scientists. Four or five pages on the public school administrator surely do not exhaust the research in organization and administration—indeed, studies relevant to it are discussed at the end of the chapter preceding this topic, and at the beginning of the chapter following it.

The major disappointment the book offers can be summed up, by analogy, in one of its own sentences about successful adult programs in public schools, as reported by two authors who "indicate 18 factors re-

lated to the excellence of adult education programs in public schools." (They do not, however, define excellence.) Factors making research useful are freely implied throughout; but research is neither defined very clearly nor evaluated by stated criteria. In many cases the "findings" seem to be accepted because of the standing of their author; or results to be included because no one else had done that kind of study. Thus the book is not itself an encyclopedia of valid research, but rather an extended discussion of the kinds of study that are going on and that are needed.

By the same token, the book as a whole might better have been entitled "An Overview of Adult Education *in the Light of Certain* Research." There are discussions of adult education itself, and of the needs of educators and of training curricula, and assertions of educational philosophy that are not clearly derived from the research data more than from the authors' own habits of mind. For myself, I welcome these *obiter* as giving the writing a kind of personality that mere bibliographies cannot have, and that makes it a more teachable book, but this kind of personal opinion should not be confused with the definitive findings of a science. There is also a rather uncritical tendency in places to assume that a study by an administrator belongs under administration, and so on. There is an exemplary list of *teaching* objectives in the chapter on Administration, and a fine set of *administrative* criteria from another study is cited in the chapter on programming. There is the normal quota of laborious research proving what is self-evident, common knowledge, or trivial fact. More serious is the occasional tendency to confuse co-variance with causation; for example, lack of active participation in an organization tends to cause lack of interest in its objectives. These are, in the main, the faults of the researchers cited rather than of the authors who cite them; but their very presence indicates how great is the need for new efforts to create *an educated judgment among educators* themselves about the design, evaluation, and utilization of research bearing on their tasks.

These are fond scoldings; I could have cited many passages that I admire. There should be widespread reading and discussion of the book as a whole among all educators of adults; there is already need to bring it up to date, as every year brings new quotas of research into our field. Moreover, as Abbott Kaplan points out in his Research Review in *Adult Education* (ix, 4, Summer 1959), there is a "paucity of studies dealing with the philosophy, values and objectives of adult education," most of which are uncritically based even today "on formulations which date prior to World War II." The self-image of the adult student, of the educator, of the institution, and their images of one another and of "the community" and its dynamics, are in urgent need of revision; and both philosophical criticism and process research must be sharp and continuous if we are not to dream on to oblivion.

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The Adolescent Through Fiction, by Norman Kiell. New York, International Universities Press, Inc., 1959. 345 pp. $5.00.

It used to be said of the brothers James that William, the psychologist, wrote like a novelist, and Henry, the novelist, wrote like a psychologist. Although the quip was not so intended, it was undoubtedly a greater compliment to William than to Henry, for while psychologists have not always been distinguished for the clarity of their prose, it is almost impossible to find a serious novelist whose work does not abound in psychological insights. Indeed, this was fully recognized by Freud, who wrote:

> Story tellers are valuable allies and their testimony is to be rated high, for they usually know many things between heaven and earth that our academic wisdom does not even dream

of. In psychological insight, indeed, they are far ahead of us ordinary people, because they draw from sources that have not yet been made accessible to science.

Taking his cue from this, Norman Kiell, who teaches adolescent psychology at Brooklyn College, wrote his book, *The Adolescent Through Fiction.*

Dr. Kiell has written an elementary textbook on adolescent psychology, but one with a difference. The difference is that for each point Dr. Kiell makes about the troubled but exciting world of the adolescent he presents an excerpt from contemporary fiction that is intended both to dramatize and to illuminate the point. "Through fiction," Dr. Kiell writes, "the student can come closer to the dynamics of adolescent development."

In addition to advancing the notion that fiction stimulates imaginative responses in the student of psychology, Dr. Kiell implies that the best fictional accounts of human behavior are no less truthful or real than the best scientific accounts. Psychological facts are misleading and meaningless when removed from the specific human situation from which they were originally inferred. The facts one is presented with in, say, Gesell's *Youth* have meaning only to the extent that each reader provides them with a context drawn from his own experience, which is to say, he becomes his own storyteller. But few of us are as adept at this as the novelist, whose artfulness is ultimately judged by his capacity to imagine and then develop situations in which human beings reveal themselves. In other words, any good story presents plausibly arranged psychological facts. Few people have been as much aware of the novelist-as-practicing-psychologist as professional psychologists themselves, and the author provides in his introduction impressive quotations from scientists testifying to the valuable service that literature performs for psychology.

The principal problem facing the author was the selection of appropriate literary material. Dr. Kiell has chosen widely and well, for among the fifty-four excerpts from novels about adolescents are the insights of Somerset Maugham (on physical development); James Joyce (on developing equilibrium); Walter Van Tilburg Clark (on getting along socially); Thomas Mann (on the meaning of sex); H. G. Wells (on learning); and D. H. Lawrence (on becoming an adult, which, presumably, the United States Post Office does not oppose). Some of these selections are not always as cogent as the author imagines them to be, and there are some barely forgivable omissions (it is disappointing, for example, to find no excerpts from either *The Catcher in the Rye* or *The Diary of Anne Frank*). But in every instance there is undeniable pertinence. The author's familiarity with the wide range of available material is evidenced by a valuable bibliography of almost 500 novels of adolescence; one of articles and books dealing with psychology and literature; and one of texts on adolescence.

For anyone interested in knowing more about that increasing, impressive, and powerful minority group known as "adolescents," this book will serve well.

NEIL POSTMAN
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Public Schools and Moral Education, by Neil Gerard McCluskey, S.J. New York, Columbia University Press, 1958. xii + 315 pp. $6.00.

What Happened to Religious Education? by William Kailer Dunn. Baltimore, The Johns Hopkins Press, 1958. xv + 346 pp. $5.00.

Both of the works reviewed here are concerned with the question of moral and spiritual values in the public schools. Both of them deal with the "unresolved ambiguity," to use Father McCluskey's phrase, or the "dilemma," to use Father Dunn's phrase, of a nation which believes that religion should play a role in public educa-

tion, but which is so caught up in sectarian divisions and jealousies and so committed to rights of conscience and the free exercise of religion that it finds itself unable to fulfill its commitment of belief or to implement its stated policy of teaching moral and religious values in the public schools. The NEA Educational Policies Commission, to cite a recent example, has stated that: "The teaching of moral and spiritual values in the public schools of the United States must be done without endangering religious freedom and without circumventing the policy of separation of church and state." If we are to take seriously the evidence assembled by Father Dunn in his study of the decline of religious teaching in the public elementary schools from 1776 to 1861, and the evidence assembled by Father McCluskey in his study of the influence of Horace Mann, William T. Harris, and John Dewey on the formation of the public school philosophy of teaching moral and spiritual values, the conclusion to be drawn is that the stated policy of teaching moral and spiritual values can never be implemented.

Stated in terms of Father Dunn's study of the decline of religious teaching in the public elementary schools from 1776 to 1861, the reason the policy of teaching moral and spiritual values can never be implemented is that "during the period from the Revolution to the Civil War, Christian doctrinal instruction declined in the elementary public schools of the thirteen original states (and the District of Columbia) because religious and educational leaders gradually formed a conviction that, whereas religion itself belonged in public life and public education, the inculcation of sectarian doctrines in public schools constituted a violation of the rights of conscience and the democratic concept of the free exercise of religion." Stated in terms of Father McCluskey's study here reviewed, the reason the policy of teaching moral and spiritual values can never be implemented is that "the history of the common school, as seen through the work of Mann, Harris, and Dewey, has also made it painfully apparent that the American people have been caught in an unresolved ambiguity. They have charged the common school with a responsibility for character education but they do not have a common view as to what this entails."

Father McCluskey makes it clear that disagreement over a moral and spiritual values program is the inevitable result of the irreconcilable differences among conflicting religions or philosophies or schemes of ultimate values. Hence, his first conclusion is that "after many decades of experimenting, the problem of moral education in the common public school is more defiant of solution than ever—is, in fact, insoluble." The real question is whether religion can be separated from morality, whether character training must be rooted in religious values or related to religious sanctions. Advocates of nonsectarian and nondenominational religious instruction have almost always been frustrated by the courts. Nearly all states specifically forbid the teaching of any doctrine favorable to a single sect or distinctive of any religious group. The courts have repeatedly reaffirmed the doctrine of religious liberty and have prevented invasions of rights of conscience. Hence, Father McCluskey's second conclusion is, "The principle that religious freedom in a religiously divided community requires the elimination of any teaching or practice from the common school not acceptable to everyone makes it impossible to preserve any kind of traditional religion in the school."

The current absence of religion from the public schools is mainly attributable, Father McCluskey argues, to the historical working out of the nonsectarian principle espoused by Horace Mann. The process of religious exclusion was hastened by William T. Harris, who was opposed to religious teaching in the classroom, though he did not oppose it in the appropriate setting of the church. The process of religious exclusion was brought to a completion by the work of John Dewey, whose naturalistic orientation left no place for supernatural religion

either in or outside the school. Hence, Father McCluskey's third conclusion is that "the value philosophies espoused by these three men have led to the widespread elimination of religion from today's schools." Moreover, Father McCluskey finds the value philosophies espoused by Mann, Harris, and Dewey, consistent with the NEA Educational Policies Commission definition of moral and spiritual values as "those values which, when applied to human behavior, exalt and refine life and bring it into accord with the standards of conduct that are approved in our democratic culture." Since the policy statement excludes religious sanctions from the public school classroom, Father McCluskey is led to his fourth conclusion: "Because sanctions are limited to a secular order and cannot be normally related to religious values, natural or supernatural, character education in the public schools is necessarily circumscribed by the purely secular order."

Finally, noting the growing concern over the development of a dual system of schools and the dangers of "parochialism," Father McCluskey concludes: "Unless serious efforts toward compromise succeed in modifying present patterns, the American public school will of necessity become increasingly secular. This in turn will continue to augment the percentage of children in nonpublic schools placed there by parents who desire some religious orientation in the formal education of their children." Father McCluskey's conclusions do not of course coincide with those of Father Dunn, who holds that the tradition of protecting the rights of conscience can be balanced with the tradition that religion belongs in public education. He believes that "factual study of religion" and programs of "released time" are but rungs on the ladder which is leading to the return of religious instruction in the public schools. "A restoration of the tradition that 'religion belongs' is one of the tasks of educators devoted to the 'American way of life,'" Father Dunn writes. "As religion comes back into public education, care must be taken that its operation does not violate the rights of conscience. Nor must overemphasis on these rights be allowed to strike down religious instruction again."

But Father Dunn, on a historical basis, and Father McCluskey, on a philosophical basis, demonstrate that unresolved historical dilemmas and unrelieved philosophical ambiguities are not to be so casually written off by those who have appointed themselves to state the educational policies of the nation. The contradiction which remains unresolved has been adequately stated, from the historical viewpoint, by Father Dunn, who writes: "In holding two convictions, namely that religion belonged in public education and that instruction in sectarian doctrines could not remain in the curriculum, the people whose writings have been examined created for themselves a dilemma, in the attempt to resolve which they eliminated both religion and sectarianism. Such seems not to have been their intent, but such was the result of their actions. The struggle over sectarianism, then, and not hostility or indifference to religion as such mainly caused the decline of religious teaching." But it seems to this observer that Father Dunn now wishes to reproduce those struggles by introducing religious instruction as a part of "the American way of life."

After reading the McCluskey and Dunn books, this reviewer has come to the conclusion that the question of moral and spiritual values in the public schools will never be resolved to the satisfaction of the contending parties. Though Father Dunn takes an optimistic view and Father McCluskey a pessimistic view about the possibility of introducing religious instruction in the public schools, both have assembled enough evidence to convince this reviewer of the futility of reproducing the sectarian struggles of the nineteenth century and the tragedy of invalidating the rights of conscience of the eighteenth century.

RICHARD D. MOSIER
University of California, Berkeley

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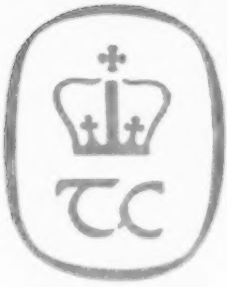
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